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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

CONSTRUCTION GOALS FOR THE FINAL YEAR OF THE FIVE-YEAR PLAN

Moscow EKONOMIKA STROITEL'STVA in Russian No 1, Jan 80 pp 10-13

[Article by A. O. Stepun, Deputy Chief of USSR Gosplan's Consolidated Division for Capital Investments: "The Concluding Year of the Five-Year Plan"]

[Text] The Soviet country and all of the people are totaling the results from last year, the fourth year of the five-year plan. The Soviet people are noting with satisfaction their achievements in the economic and social development of the motherland and in improving the well being of workers.

Much was done last year to further increase the rate of growth in industrial and agricultural production and to develop science, culture, health services and education. This was emphasized at the November 1979 Plenum of the CPSU Central Committee and at the USSR Supreme Soviet sessions where the Statute Concerning the State Plan for Economic and Social Growth in the USSR for 1980 was passed.

Capital construction workers have also made great contributions toward the development of the socialist economy. The personnel at many combines and trusts, having expanded socialist competition, successfully coped with their tasks and ensured that more than 200 large industrial enterprises, hundreds of shops and installations at existing factories and plants, large agricultural structures and transportation buildings were put into operation.

During the past year construction workers and assemblers did fine work constructing the Kursk atomic power plant, an initial oil refining plant at the Nizhnekamsk Petroleum and Chemical combine, the "Zapadno-Donbas" high-powered mine No 6/42, structures for producing mineral fertilizers at the Sumy and Rovenskiy production enterprises and sulfuric acid at the Voskresensk production combine and many other enterprises that have important significance for the national economy.

Significant success was achieved in erecting structures not designed for industrial purposes. Housing units having a total area of 102.5 million square meters were put into use (approximately 10 million workers obtained apartments in them). General education schools for 1,340,000 pupils and preschool institutions for 595,000 children were built; the number of beds in hospitals grew by 67,000 as a result of the new medical institutions that were put into use.

However, at nowhere near all of the sites that have important significance for the national economy was construction carried out according to the projected plans and schedules. Technological equipment and design-estimate documentation were not provided on time everywhere. It was for this very reason that the production capacities at the Lebedin, Olenegorsk, and Severnyy mining enrichment combines, the Cherepovets and Zapadno-Sibir metallurgical plants, the Yavan electro-chemical plant, and other sites were not put into operation.

At present the ministries, council of ministers in the Union republics and central planning agencies are determining the new time schedules for putting capacities and structures into operation that were not able to be built during the past year. It is important to calculate correctly the remaining amount of construction and assembly work, carefully check the kinds of equipment, devices and cable products that are needed to put capacities into operation, coordinate the times for their installation with the new time schedules for completing construction, organize strict control over the pace of work at construction sites, and render the necessary operative assistance to them.

But it is most important that the necessary preparations be completed in a short period of time for successfully accomplishing the program in 1980 of further building up the capacities of industry, developing agriculture, transportation, and communications, constructing towns and workers' settlements and housing and cultural-domestic projects in villages. And this is a very broad program. The volume of state capital investments set for the year comprises 119.1 billion rubles. The total volume, including construction carried out by means of funds from kolkhozes and other cooperative and public organizations and from the population's funds, exceeds 135 billion rubles.

In connection with the necessity of further strengthening the foundation of our economy--heavy industry--it is specified that 13 percent more capital investments are to be allocated than were spent during the previous year.

In order to provide the national economy with a steady supply of electric power and fuel 21.5 billion rubles, or 7.9 percent more than last year, must be invested for the development of the fuel and electricity complex.

Capital investments are being increased significantly for the mining enrichment (by 20.7 percent), oil refining (by 16 percent), and coal industries (by 16.3 percent).

Ferrous and non-ferrous metallurgy will achieve further growth, on whose successful development many sectors, especially machine building and capital construction, depend. Capital investments for ferrous metallurgy will increase by 11.1 percent and for non-ferrous metallurgy by 15.2 percent.

The chemical industry will also grow at a rapid pace. In comparison with 1979, capital investments will be increased by 25 percent for this sector.

In accordance with party and government policy for increasing the importance of technical reoutfitting and reconstruction of enterprises, mechanizing difficult and time-consuming work, and establishing new highly efficient technological processes on the basis of new technology, special importance is being given to the accelerated development of machine building. It is specified that 14 percent more funds are to be invested in this sector than in the previous year including a 31 percent increase for transportation and heavy machine building, a 21.7 percent increase for the electrotechnical industry, a 31.4 percent increase for chemical and petroleum machine building, an 18.4 percent increase for tractor and agricultural machine building, and an 18.1 percent increase in cattle breeding and fodder machine building.

The volume of work related to constructing enterprises and structures for food and light industries will significantly increase which should contribute to the more complete satisfaction of the population's demands for industrial goods and foodstuffs. In comparison with 1979, the volume of capital investments will increase by 20.5 percent for light industry, by 6 percent for the food industry and by 4.8 percent for the meat and milk industry.

Production capacities for shoes are projected to increase by 17.9 million pairs per year, and for outer knitted garments by 15 million articles. The output of sugar refineries should increase by 106,200 quintals of sugar beets processed per day, of meat packing plants by 547.5 tons of meat per shift and of creameries that produce whole milk products by 2,900 tons per shift.

A large construction program has to be completed in 1980 for the further development of agriculture. It is projected that 37 billion rubles of state and kolkhoz capital investments are to be set aside to complete it, which is 1.8 billion rubles or 5 percent more than in 1979. These funds comprise 27 percent of the total volume of capital investments for the national economy.

The volume and pace of work for converting the non-fertile zones of the RSFSR is significantly increasing. Greater results could have been achieved in solving this important problem for the national economy if serious delays in developing bases for construction organizations in this region had not come about.

Construction ministries and the Main Administration for Construction in Non-Fertile Areas and Aquatic Construction must take decisive measures to correct the situation which has been created, systematically increase the capacities of contract organizations and ensure their effective use.

During the current year we have to put into operation new complexes for breeding and fattening young animals that can accommodate 101,000 head of cattle, complexes for breeding and fattening pigs that can accommodate 1,082,000 head, poultry plants for obtaining eggs that can accommodate 6,780,000 laying hens, and plants for obtaining poultry products that can accommodate 101.1 million head of fowl. Eight hundred and forty-nine thousand hectares of land have to be drained, 756,000 hectares have to be irrigated and 6.8 million hectares of pasture land have to be cleared.

In 1980 the construction of large irrigation systems will continue in the Karshin steppe, and Uzbek SSR as well as construction of the second phase of the Severo-Krym canal in Ukrainian SSR, the Komsomol' irrigation system in Saratovskaya oblast, the Bol'shoy Stavropol'skiy canal, the Krasnodar irrigation system, and others.

The development of railroad transport should proceed at an unprecedented pace in comparison with the five-year plan. Six hundred and seventy-nine kilometers of new railroad lines are planned to be put into continuous service including the Berezovka-Komsomol'sk line (199 kilometers)--the first section of the Baykal-Amur mainline. It is envisioned that 1,105 kilometers of secondary routes will be put into operation in the direction of heavy freight traffic. Electrification of the Sredne-Sibir mainline from Barnaul to Omsk will be completely finished.

Much awaits to be done to further improve housing and everyday conditions for workers. Housing units with a total area of 109.4 million square meters must be built during the year, including 78.7 million square meters through state capital investments, which is 6.2 million square meters more than were put into use during the previous year. It is envisioned that general education schools for 1,125,000 pupils, preschool institutions for 597,000 children and hospitals with 65,800 beds will be built.

A large amount of funds will be allocated in 1980 for the reconstruction and technical reoutfitting of enterprises--18.4 billion rubles (17.6 billion rubles were in the plan for 1979).

During the current year strict time schedules have been established for providing capital construction plans that have been refined based on the year's results to the enterprises, organizations and construction sites. In particular the title lists of construction sites intended for industrial use, approved according to the established procedure and including calculations of the results of fulfilling the plan for the previous years, must be brought to the combines, enterprises, organizations, and construction sites no later than 15 February. Together with this it is necessary to present all title lists and capital construction plans to the financing bank by 25 February. Observing the established time schedules will make it possible to coordinate intra-construction title lists and conclude contract agreements. As practice has shown during the previous year, in order to achieve this great attention is needed from the organization of the construction ministries and the ministries who are the clients as well as operative solutions to problems that arise with the state's interests in mind.

Working out overall schedules for completing construction assembly work at start-up sites, coordinating schedules for the delivery of technological and assembled equipment with Main Administrations for Assembling Equipment and the territorial agencies of USSR Gossnab, and working out measures for providing start-up construction sites with manpower demand serious attention.

In order to successfully complete the construction program for 1980, and most of all to meet the goals for putting production capacities and sites into operation, it is necessary to decisively put an end to the dissipation of material and labor resources of construction-assembly organizations. While skillfully maneuvering them it is necessary right from the beginning of the year to direct the energy of the contractors towards the rapid completion of work at sites where construction had not been completed last year and at 1980 start-up construction sites. Everything that is necessary to complete the work in accordance with the plan must be provided to the construction sites where complete imported equipment is used and where construction is carried out on the basis of compensation agreements.

It is necessary for the ministries to increase the personal responsibility of managers in construction-assembly organizations and combines for the concentration of material resources and manpower at start-up construction sites. The findings of inspections of the work at individual trusts that were conducted by the USSR Stroybank [Construction Bank] last year testify to the fact that the distribution of a contract organization's energy and resources and their diversion to sites of secondary importance are not always given the necessary amount of evaluation.

Concentrating resources at large construction sites that have important significance for the national economy, accelerating the pace of construction and shortening its duration depends a great deal on the mobility of construction subdivisions and on their capability of concentrating their energy on decisive sections of work. Last year mobile construction organizations were started in the USSR Ministry of Construction for Heavy Industry, the USSR Ministry of Industrial Construction and the USSR Ministry of Construction which meet these goals. However, their establishment is not proceeding at a sufficiently active pace.

Problems relating to locating the newly established organizations, equipping their supply buildings and quarters and manning construction machinery, equipment and means of transportation have not been solved everywhere. The problems of efficiently stocking the organizations and regulating their interrelationships with general contractors need solutions.

During 1980 specialized general construction ministries and organizations of other ministries that carry on construction assembly work must complete 69 billion rubles worth of contract work. This is 5.5 percent more than was done in 1979.

The work program for the principal construction ministries is being significantly increased. Thus the program for the USSR Ministry of Construction will increase by 11.1 percent, for the USSR Ministry of Industrial Construction by 9.8 percent, for the USSR Ministry of Agricultural Construction by 7.8 percent, and for the USSR Ministry of the Heavy Construction Industry by 7 percent. The volume of construction assembly work for the USSR Ministry of Energy and the USSR Ministry of Construction for the Petroleum and Gas Industry is being increased by 5.4 and 4.1 percent in comparison with 1979.

In certain regions the concentration of construction is creating a tense situation, resulting from the necessity to accelerate the start of operations for production capacities in 1980 and to set up anticipatory work for preparing enterprises and structures that are under construction to be put into operation in subsequent years. Combine and trust administrators who direct the construction in these regions must immediately complete all of the necessary work to eliminate the "tight spots" and to provide the construction sites with the necessary number of construction workers and assemblers.

It is planned that 3.5 billion rubles are to be allocated in 1980 to develop industries that build component parts and structures and to strengthen the material base of construction and assembly organizations. As in past years a large portion of these assets must be used to acquire machinery, mechanisms and means of transportation.

During the current year new, expanded and reconstructed enterprises that have additional production capacities of 4.7 million cubic meters of prefabricated reinforced concrete structures and components have to be put into operation and the output of operating enterprises has to be increased by 2.03 million cubic meters through their technological reoutfitting. By this means the output of plants that produce steel building structures should increase by 92,200 tons (including 25,000 tons as a result of technical reoutfitting) and plants that produce aluminum structures and articles by 5,500 tons. The output of woodworking combines and plants that produce carpentry items is expected to increase by

2 million square meters. The output of enterprises that are engaged in capital repairs for construction and road machinery and mechanisms is projected to increase by 12.7 million rubles of annual production.

It is necessary to complete the specified program in the established time period and to significantly improve the use of capacities at operating enterprises of the construction industry.

Much has to be done during the coming year to introduce new techniques and technology and effective building structures and materials in construction manufacturing.

Thus the volume of completely prefabricated construction in monetary terms should reach 25 billion rubles and increase by 5 percent in comparison with 1979. Along with this the volume of large scale panel and volumetric-block housing units that are put into use will increase by 6.7 percent; the total area of these housing units should comprise 44.3 million square meters.

Plans for utilizing more efficient construction materials stipulate the broader use of higher strength steel (12 percent more for the production of building structures and 63 percent more for wide-flange beams). The production of reinforced structures manufactured by percussion technology should increase by 16 percent.

The plan for 1980 stipulates a 3.5 percent increase in labor productivity in construction work including a 4.5 percent increase for general construction ministries. This is a tight but realistic goal. Construction-assembly organizations have large reserves to realize this goal. They are contained first of all in improving engineering and organizational preparations for construction production, perfecting the organization of labor and the rational use of working time and a more effective use of construction techniques. In order to fully uncover these reserves and use them at construction sites and combines the ministries must constantly carry on organizational work.

As is well known labor productivity for the first three years of the five-year plan increased by only 5 percent at USSR Ministry of Construction for Heavy Industry construction sites, by 3.5 percent for the USSR Ministry of Construction and by 2.6 percent for the Ministry of Industrial Construction, with the goal being 31.2 percent for the current five-year plan. Only as a result of measures for improving the organization of production and labor is it assumed that labor productivity in construction for 1976-1980 will be increased by 10.8 percent. The actual increase for the three years comprised only 3.2 percent.

Just the same losses in working time at construction sites were great. They are related to internally replaceable losses as well as hidden losses resulting from waste removal, alterations and interruptions of construction processes.

Improving the use of construction techniques is an important reserve for increasing labor productivity. For the fourth year of the five-year plan more than half of the capital investments that were earmarked for the development of production bases for contract organizations were spent to acquire machinery and mechanisms. As a result the mechanization of labor increased for the principal construction ministries by 26 to 29 percent. However, the technology which is available is not being used with sufficient effectiveness; the average daily usage of machines stabilized at the level of 10.5 to 12.8 hours and in recent years has practically not increased.

In order to replenish yards that house equipment and to replace worn-out machinery, construction workers will receive about 7.500 excavators, 8,200 bulldozers, 6,400 truck cranes, 1,700 tower cranes, and other construction equipment. The problem is found in utilizing the equipment with greater effectiveness.

Completing the program for capital construction that has been planned for the year demands huge amounts of organizational work by the ministries and combines directly at construction sites in order to eliminate the serious deficiencies in organizing construction production, to concentrate material, labor and financial resources at start-up and important construction sites, and to adjust the precise interactions of construction subdivisions as well as client organizations, staffing organizations and plant-suppliers of equipment and structures.

1980 is the year preceding the transfer of the entire construction production line to the new planning and economic methods that have been stipulated by the CPSU Central Committee and USSR Soviet of Ministers Decree "Concerning Improvements in Planning and Increasing the Influence of Economic Mechanisms for Improving the Efficiency and Quality of Work." Therefore, much difficult preparatory work has to be carried out for planning and evaluating the activities of contractors and clients based on a new system of indices and for calculating the sites that have completed the transition to a system that is based on a construction organization's actual requirements for material-technical supplies as determined by design-estimate documentation.

There is no doubt that construction workers are applying all their efforts to translate into reality the decisions made at the November (1979) Plenum of the CPSU Central Committee and the sessions of the USSR Supreme Soviet for successfully completing the construction program for the concluding year of the 10th Five-Year Plan.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

PROGRESS, PROBLEMS OF CONSTRUCTION EXPERIMENT DISCUSSED

Leningrad STROITEL'STVO I ARKHITEKTURA LENINGRADA in Russian No 12, 1979
pp 8-9

[Article by V. F. Kamenev, chief of the Bureau for Expert Evaluation and the Improvement of Designs of Glavzapstroy: "The Experiment Has Succeeded. Now What?"]

[Text] For the fourth year within the system of Glavzapstroy [Territorial Main Administration for Construction in the Western Regions of the RSFSR], a system has been underway started upon the initiative of the Construction Department of the CPSU Central Committee and the Leningrad party organization. Its essence is to strengthen the role of the contracting organizations in improving designs while the aim is to reduce the cost and shorten the length of erecting the projects.

It goes without saying that the contractors which possess great experience in erecting various projects and have opportunities to compare the plans of various executors are capable of incorporating substantial changes in the specifications turned over to them for building better, more rapidly and cheaply. Such work of course has been done previously, but, in the first place, somewhat randomly and episodically, and secondly, usually on the level of rationalization proposals by individual enthusiasts.

In light of the decisions of the 25th Party Congress which set taut quotas for saving material resources and reducing the estimated cost of construction by 3-4 percent, such an important matter had to be taken up on a qualitatively new basis. In accord with the decree of the USSR Gosstroy, within Glavzapstroy a Bureau for Expert Evaluation and the Improving of Designs [BEiSPR] was organized and began operating in March 1976. It has now achieved certain results. What are they?

For 50 of the reviewed plans with an estimated cost of 507 million rubles, we have succeeded in incorporating proposals aimed at saving 50.6 million, and this is almost 3-fold above the targeted level. But this is not all. The actual implementation of the planned improvements will make it possible to reduce labor expenditures at the construction sites by 1,155,000 man-days, to save 120,000 m^3 of prefabricated and site-cast reinforced concrete, 11 million units of brick, over 17,000 tons of structural steel, and so forth. Seemingly these are not bad results.

Unfortunately, of the 50 proposals made by the bureau, up to the present only 29 have been accepted for implementation with an economic effect of 17.7 million rubles. Others at present are being approved, but the remaining 11 are not being carried out for various reasons. As we see, the overall result is still poor. What is the problem?

The main unresolved problem is the virtually complete absence of professional and productive contacts between the bureau and the clients and designers who often ignore or even boycott the experiment. How else can one explain the fact that they often give clearly unobjective conclusions on the rather sound proposals of the contractor, and delay in reviewing and reworking the specifications? And virtually all the improvements incorporated by us in the plans have ultimately been affirmed by the final arbiter, Glavgosekspertiza [?Expert Commission of the USSR Gosstroy].

Here, for example, is one of the recent conflicts between our bureau and the USSR Ministry of Light Industry [Minlegprom]. It was a conflict lasting over a year. The issue involved the plans for the Vozrozhdeniye [Renaissance] Spinning and Weaving Mill as well as the technical specifications for the production building of the Tribuna Garment Association. In January 1979, Glavgosekspertiza had recognized the soundness and advisability of the proposals which had been submitted by the BEiSPR. Here the Glavgosekspertiza also noted the poor quality of the designated specifications. The client continued to resist even after Glavgosekspertiza in April again affirmed its conclusion. In the present autumn, the representatives of the GPI-3 [State Design Institute] and the USSR Minlegprom again endeavored to defend their version of the plans. And again without success. But time was wasted and money spent on business trips.

The multilevel system of reviewing differences of opinion also contributes to the red tape. And our bureau's lack of legal rights necessary for applying certain sanctions against the clients and designers makes it at times helpless. In all instances it must play the role of a requester and only interested party. Obviously it would be better to proceed in such a manner that not the contractor would submit the question for arbitration by the USSR Gosstroy, but rather the ministries and departments would present their explanations there.

For improving the efficiency of the important state measure aimed at a substantial reduction in the cost of construction, there is an acute need to publish a uniform statute approved by the USSR Gosstroy for all the expert evaluation bureaus, and to clearly define their powers in the relationships with all participants in the investment process. Here active measures must be provided particularly against those who refuse to accept more progressive design variations which entail a national economic benefit. This question is extremely timely not only for us. The expert evaluation bureaus set up from the example of the Leningraders at Glavmosstroy [Main Administration for Housing and Civil Construction in the City of Moscow] and Glavsreduralstroy [Main Administration for Construction of Enterprises in the Regions of the Middle Urals] of the USSR Ministry of Heavy Construction have achieved positive results. But here as well valuable experience which produces a great economic effect is slowly being introduced into practice. Certain workers on the staff of the client ministries and design organizations are unwilling to implement the proposals of these bureaus.

Incidentally, the difficulties in approving the proposals received from the bureaus in no way always reflect a reticence by the other party to observe proper honors. This also is a consequence of the full material disinterest of the client and designer in revising and reworking the initial specifications.

At the same time, economic incentives should be the core of the experiment carried out and its effective lever. In particular, provision was made to employ economic accountability methods in the relationships of all the involved parties in implementing the proposals of the bureau. The essence of this was that the difference between the cost of construction set in the approved estimate and the corrected one after the improving of the plans was to remain at the disposal of the contractor as a formed savings. The reworking of the plans was to be carried out by the design organization from unforeseen expenses.

The savings received by the builders, in comparison with the previously established estimate, should be accounted for in the fulfillment of the work plan and the quotas for reducing work costs. Almost one-third of the formed profit should be channeled into the budget, and this would ensure national economic interests, while the remaining share would go for economic incentives for the contractor, for replenishing and developing his production facilities, as well as for expenditure on sociocultural measures and housing construction.

The intentions, as we see, were very enticing. Unfortunately, it must be stated that during all the years of operating under the new system, neither the construction organizations nor the expert evaluation bureaus felt a true interest.

Obviously the initially accepted method of economic incentives required an improvement. According to the current statute, a transfer of the savings to the contractor is planned only after the entire complex or project has been accepted for operation. And thus it turns out that the actual moment of compensation is separated from the actual implementation of the proposals...by a significant period.

The incentive procedure has been somewhat improved by the decision recently approved by the USSR Gosstroy with the agreement of the USSR Gosplan, the USSR Stroybank and the USSR Gosbank to turn over to the contracting organizations the savings piecemeal, proportionately to the amount of performed work. But in our view, another step should be taken after this. It is essential to permit the use of the saved funds immediately after they have been received by the contractor. In other words, after the showing of the savings in carrying out the plan for construction and installation work, the savings must be immediately considered as the actual expenditures in terms of costs, and at the same time be transferred to a special account of the glavk [main administration or trust]. But the procedure for expending the profit can remain as before. Such a system will make it possible to encourage the participants of an important state measure in a more correct and flexible manner.

But as yet, unfortunately, this is not the case. Trust No 32 used over a million rubles for building the machine repair plant of Lenmeliovodstroy [?Leningrad Administration for Land Reclamation and Water Management Construction] in Tosno, but up to the present it is unable to report on the completed work, since the financing of construction is carried out according to the initially approved plans, while in actual terms the work is being carried out according to the variation proposed by the BEiSPR.

During the period the bureau has been at work, we have repeatedly encountered instances of imbalanced planning, when the programs of the client and contractor ministries have been uncoordinated. For example, the allocating of capital investments for building a number of light industry enterprises was not provided with the corresponding amount of technological design specifications. As a result, the construction workers were forced to accept clearly understated plans for the erection of these projects.

It must be admitted that the completion of the first complex in the Plastopolimer [Plastic Polymer] Association which was created considering the proposals of the BEiSPR was also unforgivably drawn out. Here there were such mix-ups as delayed delivery of equipment, a lack of coordination in the work of the general contractor and subcontractors, and imprecise planning. For this reason here the economic effect which would be expected by accelerating the completion of the project was reduced.

The elimination of the uncoordinated actions of the clients, designers and contracting organizations is provided for in a series of specific provisions of the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Improving Production Efficiency and Work Quality." In his speech in Dnepropetrovsk, the General Secretary of the CPSU Central Committee and Chairman of the Presidium of the USSR Supreme Soviet, Comrade L. I. Brezhnev, drew attention to the necessity of disclosing the bottlenecks in capital construction and rectifying the situation step by step. And it is the duty of all managers to focus their attention on eliminating the flaws.

One other problem common to all the expert evaluation bureaus is their staffing. Since they see as their main task not so much the seeking out of errors as a creative competition with designers, the personnel of these new organizations should be recruited from highly skilled specialists who possess great production know-how. To a certain degree, the urgency of the question can be eliminated by involving pensioners who are undoubtedly experienced and authoritative persons. Here we were significantly aided by the recently approved Decree of the CPSU Central Committee and USSR Council of Ministers "On Measures Relating to Material Incentives for the Work of Pensioners in the National Economy." At present, starting in 1980, pensioners involved in expert evaluation work will have the right to receive from 50 to 100 percent of their pension.

All of this is all the more essential as in following Glavzapstroy, the pioneer in the expert evaluation of design and estimate specifications, a number of the republic construction ministries and large glavks have joined the experiment. All of them must encounter analogous difficulties and unsolved questions.

Regardless of the presently known flaws and weak points in the experiment carried out, it has also demonstrated its strong points. Thus, the average reduction in the value of design and estimate specifications for projects reviewed by all the expert evaluation bureaus was 9.5 percent. And this was more than 2-fold above the directive level for the current five-year plan.

The current year was set as the last one for testing out the experiment. Since it has been unanimously agreed that it was completely successful, everything must be done so that the commenced work grows into a permanently operating system reinforced in the legislation for modern capital construction. For this it is essential both to work out a complete compendium of organizational and legal documents, as well as turn the bureaus into official bodies with a precise range of powers.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

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FINAL OUTPUT TO BE MAIN INDICATOR OF CONSTRUCTION PERFORMANCE

Moscow EKONOMIKA STROITEL'STVA in Russian No 12, 1979 pp 3-8

[Article by L. A. Muromov, chief of the Construction Economics Subsection of USSR Gosplan: "Commodity Output Is the New Plan Indicator for Construction Operations"]

[Text] The CPSU Central Committee and USSR Council of Ministers decree, "Improvement of Planning and Intensification of the Effect of the Managerial Mechanism on Raising Production Effectiveness and Work Quality," calls for a whole set of measures aimed at improving planning and control of the economy.

In accordance with the decree, plan indicators will become reliable landmarks that guide the managerial activity of laboring collectives in achieving final results. This is especially important for capital construction, the final results of which --the introduction into operation of production capacity, buildings and structures--directly affect growth of the country's economic potential and raise the people's material and cultural level of life.

Starting with the Eleventh Five-Year Plan, ministries and agencies that do construction and installing work, as well as contracting organizations, should confirm the following as indicators of construction operations:

the introduction into operation of production capacity and of facilities, including growth in capacity as a result of rebuilding enterprises and reequipping them with machinery;

the total volume of construction commodity output, including the amount carried out by their own forces (the cost of construction and installing work for enterprises, phases and complexes due for startup and for facilities that have been prepared for the production of output or the extension of services and are turned over to the client), with a breakdown in total volume by client;

growth of labor productivity;

ceiling for blue-collar and white-collar manning;

total wage fund;

profit (and for various organizations--reduction in the operating costs of construction and installing operations);

tasks on introducing new equipment; and

the volume of delivery of materials, machinery, mechanisms and other supply and equipment resources necessary for fulfilling the plan.

In order to define the requirements for supply and equipment resources, the wage fund, working capital and credit, USSR Gosplan will establish for USSR ministries and agencies and Union republics the total amount (with a breakdown by client) of contracting work and the amount done by their own forces.

The main indicator of construction operations--introduction into operation of production capacity and facilities in physical units--is being changed qualitatively. The amounts of construction commodity output, profit and economic incentive funds are tied directly in with it, and the financial condition of construction and installing organizations will depend greatly upon the fulfillment of the plan for it.

The introduction of production capacity into operation will be confirmed also for subcontracting organizations that install the basic industrial and power equipment.

The indicator of the amount of work done will be completely different in content. Construction commodity output, being the cost expression for the introduction into operation of productive capacity and facilities, characterizes the final results of the activity of construction and installing organizations. The new indicator becomes gross volume and the volume of construction and installing operations (in terms of their budget-estimated cost) per shift by facility or stage of work turned over to the client.

Settlements between client and contractor will be made according to construction commodity output. And while, under the existing system of settlements, the operations paid for, when transferred from the contractor's books (from the status of uncompleted performance of operations) to the client's books, often remain in the status of uncompleted construction, the situation changes radically when settlements are made for construction commodity output. Since the new indicator for the amount of work done is compared only with the production capacity and facilities put into operation, the contractor will be paid for, and will be credited in the work results with, only output that is capable of benefitting the national economy immediately after turnover to the client.

Profit and economic incentive funds will be formed only to the extent that the plan for construction commodity output is filled.

With a view to raising the role of the construction commodity output indicator, client ministries and agencies will confirm the tasks of subordinate associations, enterprises and organizations in this area.

The decree specifies that clients will plan not the amounts of capital investment and construction and installing operations but their maximum amount and ceilings. Thus, additional opportunities are created for saving funds invested in capital construction and for concentrating the client's attention on putting the facility into operation.

In accordance with the decree, a gradual conversion will be made during the Eleventh Five-Year Plan from planning labor productivity in construction in accordance with an evaluation of the output to planning it in accordance with the net output (standard), or in accordance with another indicator that reflects changes in labor expenditures more accurately, and to determination of the wage fund by means of the standard per ruble of output. For this purpose, USSR Gosstroy is charged with preparing the necessary normatives base in 1979-1980, with the participation of construction ministries and agencies.

Net output, reflecting the labor expenditure of the builders' collective but not counting the work invested prior to those expenditures, admittedly will eliminate the contractors' motivation to raise the budget-estimated cost of buildings and structure and to perform labor-intensive and costly work to the detriment of the correct technological configuration. Planning the wage fund according to the standard will help to bring order to it, based upon the principle of equal pay for equal work.

A ceiling on blue-collar and white-collar manning is included in the plan indicators approved for construction and installing organizations.

A typical feature of the profit plan is the formation of it as a function of the final results of the activity of construction and installing organizations.

In cases where no introduction of productive capacity or facilities is planned for various quarters or for some year of the five-year plan period (or the work volume is extremely insignificant), the organization's activity will be assessed according to results in carrying out construction and installing work in accordance with the schedule thereof for individual facilities (the schedules will be confirmed by the contractor and the client). In so doing, fulfillment of the goals for reducing operating costs for construction and installing work and for increasing labor productivity is considered. In the financial plans of construction organizations, portions of planned expenditures and advance expenditure of funds for material incentives are to be covered through savings or reduction in the operating costs of construction and installing work and through plan accumulations for uncompleted work.

With conversion to settlements between client and contractor for enterprises, startup complexes, phases and facilities that are constructed and turned over for operation, the volume of uncompleted work on the part of the contracting organizations increases sharply. Expenditures therefor are now being covered mainly by client advances. It is recognized as desirable that bank credits be used for such purposes. Such a possibility is the result of the freeing of the clients' funds with conversion to settlements without intermediate payments. Contracting organizations should pay differentiated interest for the use of credit. Thus the credit system becomes one of the levers that operates to accelerate construction.

A norm has been established for covering expenditures for uncompleted work in the period between the dates for controlling credit--up to 10 percent of the annual amount of work done by the construction organization's own forces.

Since credits are issued in accordance with the budget-estimated cost of the operations, the contracting organizations should form a saving for uncompleted work (the difference between the estimated cost of construction and the actual operating costs for doing the work--unrealized profit). It is considered in the financial plans of organizations and is used for planned expenditures.

The remaining approved indicators for the construction work plan will not experience significant changes. It is important, however, that their stability and balance for all types of resources be provided for during the planning stage.

The procedure for planning and evaluating the activity of construction organizations in accordance with final results, combined with an expansion of economic accountability, has undergone a three-year test in Belorussian SSR Minpromstroy [Ministry of Industrial Construction] and Belorussian SSR Minmontazhspetsstroy [Ministry of Installation and Special Construction Work]. This experience has now been disseminated to the Lithuanian SSR Minstroy [Ministry of Construction] and partially (new principles for planning and evaluating the activity of construction and installing organizations) to a number of construction ministries of Union republics and territorial main administrations for construction.

Experience has confirmed that the use of the construction commodity output indicator promotes a rise in capital investment effectiveness, reductions in the volume of uncompleted construction, in the time required for construction, and in the number of facilities being erected at one time, and a concentration of material and labor resources at construction projects due for startup. Thus, in Belorussian SSR Minpromstroy the average annual growth rate in construction commodity output volume was 4.5 percent, and the average time taken to erect facilities was reduced from 30 to 24.6 months in 1978. In so doing, while in 1976 the share of contracting work done at startup construction projects was 67.7 percent in the overall ministry program, in 1978 it had risen to 81.5 percent.

In the 2 years of Lithuanian SSR activity under the new conditions for planning, the plan for construction commodity output was carried out by

102.6 percent, and the goals for introducing production capacity, housing and other facilities were carried out. The average time taken to build facilities was reduced from 23.5 months in 1976 to 20.8 months in 1978, uncompleted construction volume was reduced by 5.6 percent, and the number of facilities being erected simultaneously was cut 13 percent.

Belorussian SSR Minmontazhspetsstroy fulfilled the plan for construction commodity output for 3 years by 101.8 percent, and the number of facilities being erected at one time was reduced by 25 percent.

However, even under the new conditions of management the plan was not met in the above-named ministries for certain indicators. This is explained primarily by the fact that such deficiencies as the instability of plans, which continues to fritter away resources, and a lack of order in providing construction projects with supplies and equipment (primarily equipment) and with planning and budget-estimating documentation exerted a negative effect on the activity of the collectives that are operating under the new conditions.

As experience has indicated, the construction commodity output indicator was especially sensitive to these deficiencies. If the contracting organization settles with the client for the gross volume of construction and installing work or stages thereof, the nonfulfillment of some portion of the work does not involve substantial losses. It is another matter where settlements are made with the client for construction commodity output, for work done for specific capacity or a specific facility from the start of its construction to its turnover for operation. Calculations indicate that Belorussian SSR Minpromstroy, for example, when it does not fulfill the plan for construction commodity output by 1 million rubles' worth of work, receives 105,000 rubles less in profit. As a result, the opportunity to deduct 21,000 rubles for economic incentive funds and to receive 20,000 rubles in bonuses through the introduction of facilities into operation is lost. At the same time, an additional 25,000 rubles must be paid to the bank as increased interest. And if the facility has not been put into operation by the planned deadline through the client's fault, according to the existing procedure the contractor has the right to exact from him only the increased interest for the credit (in the aforecited example 25,000 rubles). In planning and in settlements for operations in accordance with the gross amount thereof, the contractor does not suffer any losses (except the bonus for introduction), and with consolidated settlements, they would prove to be within limits that correspond to the amount of operations carried out during the last stage of construction of the facility.

Thus, conversion to planning work volume by construction commodity output requires additional provisos for carrying out the plans in accordance with this indicator. It is not accidental, therefore, that the decree has a special section dedicated to measures to speed up the introduction of production capacity and facilities into operation and to raising capital investment effectiveness. In this section, aside from the determination of the new indicators for the work plan that guide its participants toward the final results of the activity, the ways of achieving the results also are planned.

It was indicated that primarily USSR ministries and agencies and Union-republic councils of ministers now should approve stable five-year plans for capital construction (with a breakdown of tasks by year) that are balanced with the resources of materials and technological and power equipment, labor and financial resources, and also the capabilities of construction and installing organizations. This means that contracting organizations will get the opportunity to see the outlook for the activity and to prepare the production base in good time in accordance therewith, to conduct site preparation and to organize a continuous technological process for construction. This means that they will cease to live by the plan only for 1 year, beginning each time anew on 1 January. This means that the plan will become stable and really feasible, since it will be balanced and coordinated for all indicators.

In order to provide for the rhythmic work of contracting organizations, an operational backlog of accomplished work should be created, and also, in order to observe the plan periods for introducing facilities into operation and the standard periods for constructing them, the amounts of construction and installing work for a client should be broken down in the drafts of the lists of construction project titles by year jointly with the builders.

The decree also calls for measures for regularizing the provisioning of construction projects with design and budget-estimating documentation. For this purpose, five-year planning of design and survey work is being introduced. Beginning with 1981, the capital construction plan will include only construction projects for which there are approved design and budget-estimating documentation and working drawings for the year's work volume by 1 July of the year preceding the planned year.

The currently existing procedure for presenting the contractor with design and budget-estimating documentation by 1 September of the preceding year affects the course of construction adversely; the draft of the plan for contracting work is formulated prior to this date, as a consequence of which, as a rule, the client's and the designer's assurances that the design and budget-estimating documentation will be presented on time has to be supervised. These assurances often remain simply assurances, and construction projects that have not been provided with documentation get into the draft of the plan. Transference of the date for issuing it that the decree calls for will help to stabilize plans and enable builders to prepare for operations on a sounder basis.

The inclusion of data about the requirement for materials, structure and parts in the draft documentation and the singling out therein of complexes due for startup, plus inclusion of the budget-estimated cost of the work for them, that is, the amounts of construction commodity output, will help greatly to improve the organization of construction work.

The decree contemplates measures that are aimed at putting order into supplying construction sites with supply and equipment resources. In accordance with these measures, all construction and installing organizations will be transferred to the system of obtaining material resources on their orders, which are made up on the basis of the designs and estimates. Regional USSR Gossnab organs have been charged with filling these orders.

The decree contemplates radical measures also for providing the construction site with equipment. Orders to the manufacturing ministries for its delivery will be issued for the whole period of construction.

Considering the paramount importance of rebuilding enterprises and reequipping them with machinery, the decree has set ways for increasing the share of these enterprises in total volume of construction and installing operations. For this purpose, the procedure for approving lists of construction project titles for jobs has been simplified, correction factors that increase the budget-estimated cost of operations and overhead expenditures are being introduced, and the workers' wage fund is being increased in organizations that are rebuilding enterprises and reequipping them with machinery.

In order to stimulate the acceleration of construction, bonuses for introducing production capacity and facilities into operation have been increased by an average of up to 3 percent. Moreover, where enterprises have been built in a period shorter than planned or stated in the norms, contractors will receive from clients 50 percent of the profit called for by the design (for the period by which construction was reduced). At the same time, the awarding of bonuses for reequipping enterprises with machinery is being introduced.

Construction, as a branch of the national economy, is an organic part of it. Therefore, improvement of its management mechanism, which the decree calls for, particularly such key measures as the organization of a system for long-range and current plans and a balancing of them in all directions, the creation of reserves, a strengthening of the coordination of planning by branch of industry with regional planning, and further development of economic accountability, should exert an influence on the state of affairs within construction.

As experience in the use of the construction commodity output indicator in Belorussia and other republics for planning construction operations has indicated, the application of this indicator in all contracting organizations will require much preparatory work. This work has already started. The preparation of procedural, instructional and standardizing publications and the refinement of those existing to make them reflect the methods of planning, management and incentives in construction operations called for by the decree has been organized in central agencies.

The construction ministries and agencies also must prepare to operate under the new system. The careful checking of budget-estimating documentation and the accounting for previously accomplished work should be organized in order to avoid errors in determining the amounts of construction commodity output. The complexes that are due for startup and the costs thereof must be defined jointly with client organizations. When compiling drafts of plans for introducing production capacity and facility into operation, it is necessary to analyze thoroughly the capabilities of supplying jobs with materials and equipment (including operating and power equipment) and with financing, since the plans should be really practicable.

Client ministries and agencies must invest maximum efforts in providing technical documentation and equipment on time to construction projects, especially projects due for startup, and must solve in timely fashion other questions upon which the builders' success depends.

Design organizations should devote the most serious attention to determining reliably the budget-estimated cost of construction and to identifying startup complexes and specifying the amounts of construction commodity output for them.

It is the duty of all participants in construction to do everything that depends upon them in successfully carrying out the program called for in the decree of the CPSU Central Committee and the USSR Council of Ministers, "Improvement of Planning and Intensification of the Effects of the Management Mechanism on Raising the Effectiveness of Production and the Quality of Work," and to make a worthy contribution to an upsurge of the country's economy and further improvement of the Soviet people's welfare.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

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SPECIFIC RESERVES FOR IMPROVING CONSTRUCTION WORK NAMED

Moscow EKONOMIKA STROITEL'STVA in Russian No 12, 1979 pp 24-28

[Article by I. A. Onufriyev, RSFSR Distinguished Builder: "Use Reserves for Raising the Effectiveness of Construction Work"]

[Text] It was noted in the CPSU Central Committee decree about further improving the economic mechanism and tasks of party and state organs that was adopted in July 1979 that the CPSU Central Committee considers it necessary, in accordance with the instructions of the 25th CPSU Congress, to increasingly aim all managerial and planning activity at raising production effectiveness and work quality, at achieving high final results for the national economy, and at satisfying rising social and personal requirements more completely.

In light of this task, construction ministries and their subordinate organizations once more must pay special attention to reserves for raising the effectiveness of construction operations.

In 1978 the volume of construction and installing work in our country (not counting construction at kolkhozes) was 65.57 billion rubles, which was 70.4 percent more than in 1968 (38.4 billion rubles). This growth was provided mainly by the high technical level of construction operations that exists in construction, by the production base, which is being expanded and strengthened each year by mechanized equipment, and by the selfless labor of the wage workers, engineers, technicians and white-collar workers of construction and installing organizations. In 1978 construction had 69,500 single-bucket and 12,460 multibucket excavators, 34,700 scrapers, 112,500 bulldozers, 177,800 cranes of various types, 13,500 motor graders and large amounts of other construction machinery, mechanisms and minor mechanization items; the total value of mechanized equipment in 1978 reached 12.73 billion rubles; and the coefficient of mechanization for construction work was 0.19. More than 10 million people are working in construction. The organizational and technical level of construction work is being raised each year, and the operating indicators of construction and installing organizations are being improved systematically.

At the same time, there are serious deficiencies in construction work that reduce its effectiveness. In some cases construction is started without proper site and utilities preparation and without the development of precise solutions for organizing and managing construction operations; not everywhere is central operational control being used effectively; ad hoc solutions are sometimes adopted without proper substantiation; advanced experience in the organization, technology and mechanization of operations and of labor are being poorly generalized and disseminated; and so on.

These deficiencies are known to the supervisors of construction and installing organizations and construction ministries and agencies, but their existence at construction projects indicates clearly inadequate organizational and engineering measures and an absence of the administrative measures that are necessary in some cases for effective elimination of these deficiencies.

Inspections indicate that at many construction projects, well-prepared organizational and technical measures for improving construction operations are not being implemented completely. Inadequate attention to the organization and execution of the engineering preparations period at large newly begun facilities is affecting construction-operations effectiveness especially negatively. The site preparation period usually takes up 12-25 percent of total construction time but its share of the budget-estimated cost of construction is usually 5-25 percent. This is a very important stage of construction-and-installing organization and orgtekhstroy activity, but at many construction projects it is performed without any special attention being given to it.

Stroybank has been authorized to finance the construction of main facilities only after the site-preparation work has been completed, but this rule is not being adhered to in many cases, thereby inflicting no small harm on construction. In recent years the share of construction projects at which the entire work volume of the utilities and site-preparation period was fulfilled on time was only about 50 percent, according to current-reporting data. The desire of certain construction and installing organization supervisors to start work on the main job as soon as possible leads, as a rule, to a sharp reduction in construction-work effectiveness and to a stretchout of construction.

By virtue of the fact that execution of all the work planned for the site-preparation period before starting the main construction work is a guarantee of observance of the construction work technology adopted in the work plan and provides for achievement of the prescribed indicators of its effectiveness and for the introduction into operation of capacity and facilities by the deadlines set, in our opinion, all cases of commencement of the main operations prior to the completion of engineering preparation for construction should be viewed by construction ministries and agencies as serious violations, and the people guilty of them should be severely punished. A strict procedure, the observance of which should be monitored, should be established to insure timely execution of site-engineering preparation. The preparation of utilities and the site for construction should be conducted at all construction projects without exception, not at half of them, which is now the case.

The large-scale use of factory-made, packaged unified buildings and structures instead of the construction of temporary structures has a great effect on reducing the time for doing the work of the site-preparation period and on increasing the effectiveness of this period. The wide use of unified packaged, collapsible, transportable buildings and structures helps to raise labor productivity, improve the living conditions of blue-collar wage workers, engineers, technicians and white-collar workers and raise construction operations effectiveness. Thus, according to estimates by TsNIIOMTP [Central Scientific-Research and Experimental Design Institute for the Organization and Mechanization of and Technical Aids for Construction Work] about 700 million rubles are spent each year on temporary structures, irretrievable losses from which consist of up to 80 million rubles. In recent years a number of steps have been taken to expand the output of factory-made packaged buildings; these will enable the execution of all operations of the site-preparation period to be greatly accelerated.

It is known that the main documents that govern preparations for and the execution of work on the construction of enterprises and of individual facilities are the plans for organizing construction (POS's) and work plans (PPR's).

It is known from repeated checks that the general design organizations that develop the plans for organizing construction do not pay enough attention to them and do not always discuss them with the construction and installing organizations, because of which deviations from the solutions called for by the POS's often occur.

The work plans and the critical-path schedules are developed by the construction and installing organizations themselves (or, in accordance with their missions, by Orgtekhstroy trusts), but, according to existing data, only about 60 percent of construction projects have been provided with full-fledged work plans. And even at those projects where there are PPR's, there are several deviations from them.

Experience indicates that if the POS's and PPR's--the basic organizational and technical documents--are lacking at construction projects, then the performance of construction and installing work follows its natural course and one should not expect high effectiveness from it. A stretchout of construction, an increase in operating costs of the work performed, and substantial growth of idle worker and equipment time are inevitable.

The attitude of the construction ministries and agencies toward the rule about developing and providing PPR's and about executing operations according to them becomes completely incomprehensible. In our opinion, strict administrative measures are necessary in order to apply the proper procedure to this process.

The use of central operational control in construction has a great role in improving current planning and control of construction work. A correctly organized and normally functioning central operational control service will help greatly to reduce the idle time of workers and mechanisms during shifts, to provide for the timely delivery of materials, structure, articles and so on to the workplace, and, as a result, to raise actively the effectiveness of construction operations.

However, despite the high effectiveness of using a central operational control, it has not been widely disseminated at construction projects. Only about 60 percent of construction organizations are equipped in some degree with communications equipment and use central current operations control. While central operations control is mandatory in a system of transport organizations, it is being used in construction at the initiative of the management of individual construction projects. A regulation about operational-control staffs and sources of financing expenditures for acquiring communications and other equipment for implementing central operational control in construction is lacking. The work experience of some construction and installing organizations that widely introduce central operational control indicate that the expenditures for acquiring the technical equipment for central operational control are repaid in 3-3.5 years. Despite the clear necessity for using central operational control at all construction projects, the construction ministries and agencies and the supervisors of many construction and installing organizations view central operational control as not mandatory and as unimportant. Such a lack of understanding of the necessity for this effective means for putting order into construction operations provokes surprise.

One of the factors that most importantly affects the effectiveness of construction operations is a shortening of construction time. This simultaneously is also a feasible path to reducing the amount of uncompleted construction work.

An increase in construction time over the prescribed norms is, as a rule, the consequence of:

an inadequate organizational and technical level of construction work;

a lack of correlation of the amounts of construction and installing work with the potentials of the design and the construction and installing organizations, and with the periods for manufacturing and delivering structure, as well as equipment;

a lack of long-term plans for developing construction-and-installing and specialized organizations and their production bases;

reexamination and reapproval of the lists of titles of on-site projects; and

an increase during the construction process of the budget-estimated cost of the facilities under construction, and so on.

Construction-time norms prepared for new construction projects cannot be used when rebuilding existing enterprises. TsNIIOMTP of USSR Gosstroy has worked out, "Recommendations for Determining the Duration of Reconstruction," with a view to using it as a basis, after a wide tryout, for undertaking the compilation of time norms for reconstruction work.

Inspections have shown that construction ministries, agencies and construction and installing organizations subordinate to them are not taking due steps to provide for established construction-time norms. The execution of such measures is a very large reserve for increasing construction operations effectiveness.

The effectiveness of construction work depends greatly upon a rational structure for the control of this work. All the complicating conditions for doing construction work--an increase in capacity and, consequently, in scale of the enterprises and structures under construction, the need for a sharp reduction in construction time, and the involvement of a large number of specialized organizations--require precise interaction of all participants in construction and good coordination of their activity for carrying out the work by the established deadline.

There is at present in construction a complicated management system that consists of All-Union and Union-republic construction ministries, ministries for construction within the Union republics, main regional constructional administrations and construction administrations (2,920 general construction trusts and 29,339 construction and installing administrations and other primary construction organizations). There are cases where construction organizations subordinate to 25-30 ministries and agencies are working on the land of one oblast (or kray or ASSR). The number of primary construction and installing organizations is increasing all the time, surpassing growth in the volume of work. The situation existing under which construction work is being done is becoming uncontrolled in some places.

A main area for improvement in the construction-operations control structure lies in the conversion during 1979-1981 to a two-tier or three-tier system of controlling construction, as called for by the decree of CPSU Central Committe and USSR Council of Ministers of 12 July 1979, and the simultaneous consolidation of existing organizations. Executing this measure is a great reserve for increasing construction work effectiveness not only because of a reduction in the cost of the managerial apparatus upkeep but also, chiefly, improvement of the management of construction work.

A positive factor in performing construction is the consistent reduction in labor intensiveness in doing the work. Thus while in 1965, 1 million rubles' worth of construction and installing work required 136 workers, in 1978 the figure was 83 workers, and this indicator continues to drop. This is being made possible through introduction of the industrialization of construction work, particularly by raising the level of prefabrication of building members and by factory preparation of structure and articles. The number of workers engaged in manual work in construction is being gradually reduced, although the share thereof is still about 50 percent of the total number of workers in construction.

The main causes of this high level of manual work in construction is the requirement of design documentation that walls and partitions be made of small-piece materials (brick and small bocks); the wide use of wet plaster and of monolithic floor finishing, which is done mainly by hand; the large amounts of refinement work done on structure and articles that are received at construction projects with a low degree of factory preparation; inadequate use of construction equipment; the low general engineering level of organizing construction work and workplaces at some construction projects; and the large amount of manual work in unloading and loading equipment, materials, articles, structure and other freight.

Many workers are engaged in servicing construction equipment, which is done, as a rule, manually. One of the causes of the substantial labor intensiveness in the technical servicing of machines and mechanisms is the large number of places for servicing them, the availability of parts being difficult for much of the machinery. Inspections have shown that in order to preserve the operating efficiency of construction machinery and mechanisms, an hour of work by servicing personnel is expended for each hour of equipment operation. The quality of construction machinery is being improved at a slow pace.

The operations least organized in construction work are loading and unloading, storage and transport. Indeed, the effectiveness from introducing, for example, stacks for hauling 1,000 bricks on motor vehicles is 2-2.5 rubles, and, by rail, up to 8 rubles. The introduction of stacked delivery of small-piece construction materials and the mechanization of loading and unloading work eliminate irretrievable losses from broken bricks, helps to increase the labor productivity of masons by 10-15 percent, and saves mortar greatly during bricklaying. The use of containers and stacks permits labor expenditures for loading and unloading work to be cut by 1.1-1.25 manhours for each ton of freight delivered and savings of 2.5 rubles (taking into account the reduction in losses) to be obtained. The wide introduction of an automated system of accounting for cement consumption from the warehouses of construction projects and of ZhBI [reinforced-concrete articles] plants can save 10-12 million rubles per year for the country as a whole.

The effectiveness of using containers and stacks at construction projects for delivering materials is well known to most supervisors of construction and installing organizations, and no special proof is required. However, the delivery in containers, stacks and special packaging of materials that are prepared for use in the field is used advantageously at Moscow construction projects but at a small number of construction projects in other places. This is explained by the fact that in Moscow the delivery of materials in containers and bundles is compulsory, while for all other construction sites it is only recommended. The construction ministries and agencies have, in essence, not taken any sort of steps to require the organizations subordinate to them to use this major reserve for raising construction work effectiveness.

The indicator of output in terms of budget-estimated cost per worker doing construction and installing work and auxiliary production work that has been adopted does not reveal the internal content of the changes that are occurring in construction and misrepresents the dynamics of growth in labor productivity.

The conversion to planning labor productivity in construction and installing organizations in accordance with the net output (standard) or another indicator that reflects more precisely the change in labor expenditures that the CPSU Central Committee and USSR Council of Ministers decree of 12 July 1979, "Improvement of Planning and Intensification of the Effects of the Managerial Mechanism on Increasing Production Effectiveness and Work Quality," calls for will enable the correction of the major deficiencies that now exist in planning and evaluating the level of labor productivity in construction. However, prior to converting to planning and reporting in accordance with the indicator index, all construction and installation organizations can do much to reduce labor expenditures in construction.

Expansion in the use of the brigade contract involves great reserves for raising construction work effectiveness. All the indicators of the brigades that are working under contract agreements confirm the high effectiveness of operating by this method. At present only about 35 percent of the brigades in construction are working under the brigade-contract method. The CPSU Central Committee and USSR Council of Ministers decree of 12 July 1979 stipulated that the brigade method should become the main method for performing work during the Eleventh Five-Year Plan. In order to do the main portion of the work by the brigade-contract method, during the Eleventh Five-Year Plan, it is necessary to increase during 1979-1980 the number of brigades that work under contract agreements.

The effectiveness of construction work is determined by many indicators, but they all reflect the sophistication of the construction work that exists in construction and installing organizations, and they characterize the organizational and technical level of that work, the status of introduction of the achievements of science and technology, the use of labor and material resources, the level of labor productivity, reduction in operating costs for construction and installing operations, and the level of the quality thereof.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

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ASPECTS OF CEMENT INDUSTRY AFFAIRS REVIEWED

Attention Focused on Plan Fulfillment

Moscow TSEMENT in Russian No 10, 1979 pp 2-3

[Unsigned editorial]

[Text] At the beginning of August 1979 the USSR Ministry of Building Materials Industry held a conference on the performance of the cement industry in the first half of the year and on the tasks facing the collectives of enterprises and organizations in the second half of that year and in the final year of the 10th Five-Year Plan.

Directors and chief engineers of production associations, combines and cement plants, representatives of central committees of the trade union of construction workers and workers in the building materials industry, senior officials of USSR Gosplan and Gossnab, heads of main administrations of union and republic ministries, institutes and repair enterprises took part in the proceedings of the conference.

V. I. Kushchidi, USSR deputy minister of the building materials industry, analyzed the industry's performance in detail in his paper.

The speaker noted certain achievements in the operation of enterprises and the industry's institutes over the past 3.5 years of the 10th Five-Year Plan:

i. activation of five large production lines using the dry process;

ii. further introduction of automatic process control at enterprises;

iii. a number of large-scale projects to modernize equipment and intensify production processes;

iv. sizable growth of production of high-strength and special cements accompanied by a reduction in the output of low-grade cements;

v. discovery of alinit and the development of the low-temperature technology and construction of an experimental line using this technology at the Akhangaran plant.

Some enterprises did not fulfill the first quarter's assignment for the production of clinker and cement because of interruptions in the supply of fuel, electric power and admixtures to the plant and the shortage of railroad cars for shipping the cement, and in that connection V. I. Kushchidi pointed to oversights in the preparation of the plant for the winter 1978-1979.

But advanced collectives in the industry fulfilled the first-quarter plan; these are the association Akmyantsementas, the Sebryakovo plant, the Zhigulevsk and Angarsk combines, etc., which are operating under the same conditions as the other plants. Using these collectives as an example, V. I. Kushchidi demonstrated that most of the lagging enterprises could have prevented failure to fulfill the production plan.

As a result of steps which have been taken and improved supply of fuel and electric power the second-quarter plan for cement production was fulfilled by the enterprises of Glavzapadtsement [Main Administration of the Cement Industry of the Western Regions], of the association Ukrtsement, and of the Lithuanian, Georgian, Kirgiz, Tadzhik and Moldavian republics.

But in that same quarter the following increased their shortfall in cement production (in thousands of tons): the associations Kaztsement--99.2 and Uzbektsement--140.5, the Punane Kunda plant (Estonia)--40.6, the Karadagskiy plant (Azerbaijan)--33.9, the Krichev plant (Belorussia)--60.0, the Chechen-Ingush plant--57.0, the Gornozavodsk plant--72.0 and the enterprises of Armenian--47.3. At the Chechen-Ingush plant the coefficient of utilization of two kilns whose size is 5 x 185 meters was only 43 percent of calendar time, and kiln productivity was extremely low (only 49 tons per hour). At the Gornozavodsk plant the coefficient of utilization of the same kind of kilns was only 70 percent, and the rate of output was 69.8 tons per hour.

At enterprises of the association Uzbektsement the shortfall increased in the second quarter at the Bekabad plant--15,000 tons, and at the Navoi plant, which has been operating particularly badly--230,800 tons of cement.

Of the enterprises of the association Kaztsement the Ust'-Kamenogorsk plant fell short 27,600 tons (the plant's coefficient of utilization of 5 x 185-meter kilns dropped sharply), the Semipalatinsk plant--20,400 and the production association Karagandatsement--54,700 tons.

The Navoi plant and the association Karagandatsement have not been satisfactorily bringing production lines using the dry process and equipped with 6.4 x 95-meter kilns up to rated capacity. Meanwhile the association Kaztsement, using the same kilns, overfulfilled the plan of the first half of the year both for the production of cement and also for the burning of clinker. This fact demonstrates that technical supervision is poor at the Navoi plant and in the association Karagandatsement; at the latter, moreover, rated productivity of the kilns has been attained more than once in the past.

The speaker emphasized that fulfillment of the plan for the second half of the year and the final year of the 5-year period requires improvement of manufacturing discipline at cement plants, better quality of equipment repairs and reduced worktime losses at enterprises of the trust Soyuztsemremont [All-Union Trust for Repair of Cement Plant Equipment], and elimination of recurrent repairs of equipment after major and intermediate overhauls. A warranty certificate should be issued for every machine repaired by the trust Soyuztsemremont. Plants must reinforce their repair service and be able to do current repairs themselves. Breakdowns are occurring at enterprises (for example, at the Karachayev-Cherkessk, Belgorod and Karadagskiy plants the kilns are operating under precautionary conditions because of breakdowns), and it is therefore indispensable to improve adherence to work rules and technological conditions.

At a number of plants (Chechen-Ingush, Staryy Oskol, Karachayev-Cherkessk, Topki, etc.) the know-how of enterprises which have brought the 5 x 185-meter kilns up to rated capacity is being poorly applied.

Not all enterprises which previously attained the rated capacity of the 5 x 185-meter kilns are operating at the requisite level.

The first participant in the discussion was L. V. Petravichus (association Akmyantsementas). He pointed to the drop in quality of refractories and replacement parts and the inadequate supply of up-to-date equipment to the quarries of the plant, and he emphasized the responsibility of ministry officials for the supply of fuel, diatomaceous earth, gypsum and slag. It is especially important to effective operation to have a stable work force; it is important to stabilization of the work force that the socioeconomic conditions of the working and everyday lives of workers in our industry be systematically improved.

In his remarks A. Ya. Ryazantsev (Balakleya combine) noted the poor supply of replacement parts for equipment repairs and the lack of responsibility on the part of staff personnel of the trust Soyuztsemremont for the quality of repairs which are made, and he proposed that repair enterprises be made financially accountable for the operating period of machine units which have been repaired.

Yu. N. Kalugin (USSR Gosplan) spoke about the prospects for the cement industry's development, dwelling particularly on the need to eliminate the cement imbalance in Belorussia and the central region of the country.

N. A. Lyubimtsev (USSR Gossnab) emphasized the need to fulfill the plan for high-grade and special cements, since a small underfulfillment of the plan for oil-well cement, say, could have a serious impact on petroleum and gas production.

A. D. Tumanov (Belgorod plant) strongly recommended enhancement of the role of councils of enterprise directors affiliated with the main administrations of USSR Ministry of Construction Materials Industry and in the associations of republics, especially in working out unified technical policy and in disseminating the advanced know-how of enterprises in fuel and energy economy.

He also spoke about the need to enlist Soyuztsemmash [All-Union Trust for Cement Plant Machinebuilding] to take an active part in modernizing equipment and pointed to a number of shortcomings in planning the operation of enterprises.

V. M. Dotsenko (combine Novorostsement) issued a strong demand for the trust Soyuztsemremont to do the repairs on all equipment and not just kilns and mills, and he called attention to the inadequate participation of the personnel of main administrations and trade union organizations in settling social welfare issues, putting particular stress on shortcomings in the supply of special clothing.

There were 19 participants in the discussion. All the speakers made proposals aimed at improving the performance of the industry and the socioeconomic conditions of the workers' labor.

A. I. Yashin, USSR minister of construction materials industry, especially emphasized in his concluding remarks the responsibility of managers for the performance of enterprises.

In their activity enterprise collectives must take as their point of departure the decree of the CPSU Central Committee and USSR Council of Ministers entitled "On Improving Planning and Increasing the Impact of Economic Instruments on Production Efficiency and the Quality of Performance," noting that the decree makes provision for "the results of the economic activity of production associations (enterprises) in the industrial sector to be evaluated and their economic incentives to be awarded primarily on the basis of fulfillment of plans for deliveries of industrial and technical products and consumer goods according to the specifications (assortment) and schedules stated in the contracts concluded (orders), and on the basis of higher labor productivity, improved product quality and the growth of profit (in certain industries--reduction of production cost)."

A. I. Yashin noted that the overwhelming majority of enterprise directors have been meeting their obligations and that only 18 enterprises fail to fulfill the plan of the first half of the year for the cement industry because of poor management and technical supervision. At those enterprises adherence to process and work rules is low, and the breakdown rate is rising.

The minister called upon the heads of repair trusts to take effective steps immediately to improve the quality of repairs, to reduce labor expenditures and to raise the work discipline of repair personnel.

A. I. Yashin noted that the ministry's staff personnel must pay closer attention to solving the problems raised by plant directors. The preparation of the plants for the winter 1979-1980 should become the principal subject of concern on the part of personnel of the ministry and the enterprises. He recommended that particular attention be paid to improving workmanship, to proper maintenance of equipment, buildings and structures, and he called upon research and project planning institutes to improve the quality of designs, to make developments more efficient and to extend technical aid to plants.

The minister proposed that all enterprise directors take steps to improve the living and working conditions of workers, emphasizing that only a stable and skilled work force can be depended upon to solve the problems confronting the cement industry.

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Dry-Process Cement Production

Moscow TSEMENT in Russian No 10, 1979 p 10

[Article by T. O. Shakhbazyan, meritorious engineer of Armenian SSR]

[Text] There are two enterprises producing cement in Armenian SSR: the Ararat Cement and Slate Combine and the Razdan plant, both of which use the wet process.

The combine has been in operation for 45 years and the time has come to revamp its equipment. The question is the strategy for its development and the best process to adopt. Judging by the physicochemical properties of the raw-material components (natural moisture of limestone-travertines ranges within the limits 0.2-2 percent and that of the clays 10 percent), preference should be given to the dry process.

Three large automated dry-process plants have been built in our country in recent years; their kilns have an output rate of 125 tons per hour and are equipped with cyclone heat exchangers. Decarbonization reactors which will be included in the flow charts of new designs are something new.

Reconstruction of the Ararat Cement and Slate Combine ought to respond to the tasks of the industry's scientific and technical progress and should be carried out in the context of the following conditions:

i. larger cement production and consumption in the Transcaucasian republics, which represent a major economic region;

ii. a higher degree of automatic process control;

iii. high operating reliability and efficiency of production lines.

The technical-and-economic justification of the combine's reconstruction and expansion was worked out by Yuzhgiprotsement [State Institute for the Planning of Cement Plants in the Southern Regions of the USSR]. It examined the balance of cement production and consumption in the Transcaucasian republics up to 1985 and 1990. According to the institute's data, the cement shortage in this region will reach 1.2 million tons by the end of the 11th Five-Year Plan and 2.1 million tons by 1990. The shortage can be eliminated through reconstruction and expansion of the Ararat combine.

Conditions are extremely favorable for a growth of capacity here:

i. the quarry is located in the combine's immediate vicinity;

ii. the prospected reserve of limestone-travertines covers the needs of production assuming the growth of capacities over the entire amortization period;

iii. the physicochemical properties of the limestone-travertines allow for production of high-quality cement;

iv. the land adjoining the combine, which is unsuitable for agriculture, affords the possibility of expanding the enterprise with no particular difficulty.

The TEO [technical-and-economic justification or feasibility study] examined different alternatives for the combine's reconstruction. The most progressive, economical and promising is the first version, which calls for increasing capacity to 2.86 million tons at a specific rate of capital investment of 36.8 rubles per ton of output and an estimated construction cost of 79.8 million rubles and a payoff period of 4.7 years.

This version calls for installation of up-to-date and highly productive Soviet equipment:

i. 4.5 x 80-meter rotary kilns with an output of 125 tons per hour, heat consumption of 828 kilocalories per kilogram of clinker, cyclone heat exchangers and decarbonization reactor;

ii. weight-proportioning equipment that ensures a raw-material charge of the proper composition;

iii. 4.2 x 10-meter mills for grinding the raw materials with an output of 120 tons per hour which use heat from waste gases to dry the raw materials;

iv. 4 x 13.5-meter cement mills.

Process monitoring and control would be provided by an automatic system for control of raw material processing, including automatic samplers and a quantometer for rapid analysis.

The first version, which is based on the dry process, is altogether in line with the decisions of the 25th CPSU Congress on development of this progressive method of cement production.

But the technical council of the republic's ministry of building materials industry adopted a decision to recommend approval of the version that calls for construction of two production lines with 5 x 185-meter kilns and reconstruction of No 3 kiln to increase its size to 4 x 118 meters. This growth of capacity would be 1.35 million tons. The combine as a whole operating by the wet process would according to this version produce 2.04 million tons of cement, which is 820,000 tons less than in the first version (dry process).

The difficulties which could arise in mastering the 4.5 x 80-meter kilns with heat exchangers after the furnaces and decarbonization reactors have been overcome, especially in view of the fact that dry-process production lines using that equipment will be in operation in the country before reconstruction and expansion of the combine begins. Their operating know-how will make it easier to master the new capacities of the Ararat Cement and Slate Combine.

Technical and economic expediency favors development of the combine on the basis of the dry process and the most recent manufacturing equipment.

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Aspects of Cement Quality

Moscow TSEMENT in Russian No 11, 1979 pp 8-10

[Article by S. I. Danyushevskiy and Yu. V. Nikiforov, candidates of engineering sciences, and engineer V. V. Fedulova, All-Union State Scientific Research and Planning Institute of the Cement Industry]

[Text] An analysis of data on the quality of cement shipped by enterprises of all departments and on the process parameters of its manufacture makes it possible to ascertain the principal changes which have taken place in the product mix of the cement industry during the years of the 10th Five-Year Plan and to detect the most important shortcomings in this area and also to outline ways of correcting them in view of the fact that the development of progressive construction methods is imposing ever higher requirements on such properties of cement as the early rate of hardening and strength characteristics at the end of 28 days.

The high strength of cement is becoming especially important in the manufacture of reinforced-concrete fabrications designed for large loads, since the use of these cements makes it possible to reduce considerably the size and mass of these fabrications. Moreover, it is also very important that improvement of the cement grade makes it possible with the same amount of the bonding agent to make a larger amount of concrete and reinforced concrete of equal strength.

It is evident from the figures in Tables 1 and 2 that the assortment and quality of cements have been improving systematically: the share of Portland cement in the total volume of production is increasing, and the output of Grade 500 Portland cement and also fast-setting, sulfate-resistant and oil-well cements is increasing. It is very important that the production of Grade 550 high-strength Portland cement began in 1978.

Table 1

	Quantity of Cement Shipped by Years			
	1975		1978	
	Millions of Tons	%	Millions of Tons	%
Portland cement	80.6	66.9	87.7	69.8
Portland-slag cement	33.0	27.4	32.7	26.0
Portland-pozzolan cement	6.3	5.2	4.8	3.8
Other	0.5	0.5	0.4	0.4

Table 2

	Quantity of Cement Shipped by Years, %	
	1975	1978
Types of cement:		
Portland cement by types:		
Ordinary (with and without admixtures)	64.8	67.9
High-early	9.0	9.5
For asbestos-cement products	10.2	8.5
Sulfate-resistant	3.3	4.1
Oil-well	1.5	1.6
Paving	2.6	2.6
Other	8.6	5.8
Grades of cement:		
Portland cement of all types by grade:		
300	2.3	1.9
400	68.9	67.4
500	28.3	29.5
550	--	0.6
600	0.5	0.6
Portland-slag cement by grade:		
200	2.5	--
300	56.0	50.1
400	41.5	49.9

The output of tension (napryagayushchiy) cement, which is a fast-setting expanding hydraulic binder, began in 1977 on the basis of a technology developed by NIITsement [State All-Union Scientific Research Institute of the Cement Industry] [1]. Its use ensures the permeability of fabrications to water and improves their crack-resistance. In 1978 about 80,000 tons of this cement were produced. But the volume of its production is limited by raw materials resources. Giprotsement [All-Union State Scientific Research and Planning Institute of the Cement Industry] joined with LTI [Leningrad Technological Institute] imeni Lensovet in working out a composition and production technology for tension cement based on a by-product of alumina production. In 1979 a large experimental lot of tension cement, now being tested at various construction sites, was produced at the Pikalevo production association Glinozem.

Thus at the present time the cement industry is producing cements of different types and grades in accordance with the varied needs of construction. Each of these cements is characterized by a certain combination of construction engineering properties.

Mineral admixtures are widely used to reduce energy consumption in cement production and to give the cement special technical properties. In 1978 the cement industry used about 25 million tons of granulated blast-furnace slag, diatomaceous earth, opoka and other active admixtures.

But the construction industry's needs for high-strength and certain special cements are not being fully met. For example, the demand for high-strength cement in Grades 550 and 600 considerably exceeds the volume of production. According to preliminary calculations, the output of these cements in the 11th Five-Year Plan is to increase more than fivefold over 1978.

The production of Grade 600 high-strength Portland cement involves great difficulties since even at progressive enterprises and under favorable conditions with respect to raw materials and processing conditions they are not consistently obtaining a clinker with a strength (aktivnost') of 600 kilogram-force per square centimeter or higher (at 28 days).

Table 3

	Average Strength of Clinkers at 28 Days (kg-force/cm^2) Obtained From 5 x 185-meter Kilns, by years				
Enterprises	1975	1976	1977	kg-force/cm^2	σ*
Production association Akmyantsementas	480	493	468	452	28.7
Ambrosiyevka combine	457	463	462	470	15.7
Achinsk combine	--	401	431	408	24.1
Balakleya combine	549	532	506	482	27.8
Bol'shevik Plant	494	451**	448	435	13.3
Gornozavodsk plant	554	525	507	534	28.4
Kamenets-Podol'skiy plant	530	492	498	477	30.8
Karachayev-Cherkessk plant	429	446	436	455	8.8
Production association Mordovtsement	462	458	434	432	21.5

Table 3 (continued)

	Average Strength of Clinkers at 28 Days (kg-force/cm^2) Obtained From 5 x 185-meter Kilns, by years				
	1975	1976	1977	kg-force/cm^2	σ*
Production association Bryansktsement	--	506	517	528	25.5
Shchurovo plant	--	--	426	449	38.4
Ol'shanskiy plant	498	506	509	495	32.1
Proletariy Plant	536	543	534	528	16.7
Staryy Oskol plant	530	515	489	497	40.6
Combine Sukholozhsktsement	427	441	457	449	21.7
Topki plant	444	474	453	438	27.1
Ust'-Kamenogorsk plant	552	554	549	578	27.4
Chechen-Ingush plant	588	539	497	482	27.1

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* Mean square deviation.

** The clinker contains about 50 percent C_3S and is intended for production of sulfate-resistant Portland cement.

Many researchers have been exploring ways of intensifying the hardening process and of obtaining from clinker with a strength of 550-570 kilogram-force per square centimeter a full-fledged Grade 600 Portland cement with strength characteristics exceeding by at least 5 percent the requirements of the standard.

The method developed in recent years by Yuzhgiprotsement and NIITsement in which 5-10 percent of special admixtures called crystallization components are added to the cement mixture must be regarded among the most effective. With this method they have managed to increase the strength characteristics both in the early period of hardening and also at 28 days by 50-100 kilogram-force per square centimeter. But use of this method will be possible only after specialized production of the relevant admixtures has been organized, and that will take several years.

At present only two processes for obtaining Grade 600 Portland cement have practical importance.

The first method is to grind the cement in a closed circuit, in which favorable conditions are created for increasing the cement's content of particles between 5 and 30 micrometers, which play a decisive role in forming the strength of the hardened cement when the total specific surface of the cement powder is relatively low--3,400-3,700 square meters per gram. An important virtue of this cement is that its water requirement has a low value of normal density--26-27 percent. Unfortunately, very few mills are operating in a closed circuit at cement plants at the present time.

The second method consists of very fine grinding of the cement (to a specific surface of 4,000-4,500 square centimeters per gram) in open-circuit mills. But here their productivity drops to half or less, and there is a corresponding increase in the relative consumption of electric power, and there is also a noticeable increase in the wear of the protective lining and the grinding bodies. The cement obtained in this way has a high water requirement and is inclined to rapid reduction of strength characteristics. It is advisable, then, to produce Grade 600 Portland cement in limited quantities and as a rule only at enterprises that have grinding units with a closed grinding circuit.

We feel that the most realistic way of meeting the construction industry's need for high-strength cement is to develop the production of Grade 550 Portland cement from clinker with a strength of 530-550 kilogram-force per square centimeter, which is produced at many plants. The grinding of this cement would also be done best in closed-circuit units, but because of their small number, open-circuit mills will have to be used. The required fineness of grinding for this clinker strength, as the experience of the plants producing this cement has shown, should be 6-7 percent not passing through a No 008 sieve. Production of Grade 550 Portland cement is greatly facilitated if 5-7 percent diatomaceous earth, opoka or other highly active mineral ingredients are added to its composition. These standards should be adjusted to take into account the conditions of the plants.

The Akhangaran, Balakleya, Bakhchisaray, Brotseny, Zdolbunov and Sterlitamak combines, the Combine Sukholozhsktsement, the Korkino, Novotroitskoye and Sebryakovo plants, and certain others are the principal ones which have realistic manufacturing capabilities for organizing and expanding the production of this kind of cement.

We must also discuss problems related to the production of sulfate-resistant cement, the demand for which could go up to 10 million tons per year according to calculations of NIIzhelezobeton [Scientific Research Institute of Reinforced-Concrete Products and Building and Nonmetallic Materials].

In 1978 about 4 million tons of sulfate-resistant Portland cement with and without mineral admixtures (State Standard 22266-76) were shipped. Moreover, a small amount of Portland-pozzolan cement was used as sulfate-resistant cement. About 540,000 tons of sulfate-resistant Portland-slag cement were produced.

The production of sulfate-resistant Portland cement varies from one economic region to another. About 85 percent of this cement is manufactured by the association Vol'sktsement, the Combine Novorostsement and certain plants in the Central Asian republics. This cement is also produced in small quantities at certain other enterprises, including plants of Siberia and the Far East.

The best way of solving the problem of fuller satisfaction of the need for sulfate-resistant cement and--equally important, of reducing their shipping distances, is mainly to develop the production of sulfate-resistant Portland cement with mineral admixtures. In the clinker for this cement only the content of C_3A is limited--to 5 percent. With respect to raw materials, this clinker can be manufactured at most plants.

The strength of the clinker, which has an alumina modulus p = 1.0-1.2 and a high alite content (60 percent or higher), as a rule exceeds 500 kilogram-force per square centimeter, and its strength characteristics at 3-day curing reach as high as 300 kilogram-force per square centimeter. Thanks to this this clinker can be used also for production of Grade 500 Portland cement, as well as for high-early cement.

As for mineral admixtures to sulfate-resistant Portland cement the standard allows addition of up to 10 percent diatomaceous earth and opoka or 10-20 percent granulated blast-furnace slag containing no more than 8 percent Al_2O_3.

Possibilities in terms of raw materials and processing have been analyzed in Giprotsement for the organization and expansion of the production of this kind of cement at a number of enterprises. The production associations Bryansktsement and Volkovysktsementoshifer, the combines Sukholozhsktsement and Krichevo, and the Gornozavodsk and other plants have the most favorable conditions for this.

Further improvement of cement quality depends in large part on the strength of the clinker obtained on production lines with the 5 x 185-meter kilns, since at the present time they account for about 30 percent of the total volume of production of clinker. The manufacturing equipment of these lines and the conditions with respect to fuel and raw materials at most enterprises afford the necessary prerequisites for obtaining clinker with a strength of at least 500 kilogram-force per square centimeter (at 28 days). Nevertheless, its quality remains low (Table 3).

Unfounded assertions to the effect that temperature is considerably higher in the sintering zone (100-140° C) of these kilns than in kilns with a lower output [2] have done considerable harm to mastering the production of high-quality clinker on the lines designed for high output.

A thorough study of the microstructure of clinkers obtained in the high-output kilns for a range of conditions pertaining to raw materials and processing, which was made by the physicochemical research laboratory of Giprotsement [3, 4], showed that the clinker is usually not sufficiently roasted. The results of this research offer the basis for supposing that the incompleteness of the process of formation of the principal clinker phases is one of the most common causes of the relatively low strength of clinkers at many enterprises.

It has also been established that because of the instability of the degree of roasting the character of the predominant microstructure of the clinker varies within broad limits even between the beginning and end of a single shift: from a perfect structure in which silicate phases are distinctly crystallized and uniformly distributed and most of the alite grains are 30-50 micrometers in size to a structure with indistinct crystallization of alite and belite and their nonuniform distribution. Moreover, substantial differences were detected in the hydraulic activity of clinkers that had been well roasted and insufficiently roasted. Their strength at 28 days of curing differed in certain cases by 70-80 kilogram-force per square centimeter. It is evident that instability of the degree of roasting, along with instability of the chemical composition of the slurry is the cause of substantial fluctuations in the strength of average daily clinker samples (Table 3).

The results of this research confirm that high-quality clinker cannot be ensured solely by the proper chemical and mineralogical composition. It is indispensable that the clinker be sufficiently roasted to obtain the strength potentially embodied in the phase composition. As has been earlier noted [5], the microstructure of the clinker offers the most complete idea of the degree of roasting. Use of this criterion as part of the process monitoring system will make it possible to reduce fluctuations of clinker strength and to raise its average level.

Raising the degree of heat treatment of the material should not be the sole orientation in the effort to obtain the proper clinker microstructure. Production of a clinker with a good microstructure is also much easier if the dispersion and chemical homogeneity of the mixture of raw materials are sufficiently high, if the chemical and mineralogical composition of the mixture is correct so that a sufficient amount of a liquid phase with low viscosity value is formed in the roasted material, and also if mineralizers are used, so that we are speaking of ordinary manufacturing procedures used to improve clinker quality. At the same time favorable prerequisites are being created for increasing the output of the 5 x 185-meter kilns.

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Trends in Cement Standardization

Moscow TSEMENT in Russian No 11, 1979 pp 10-12

[Article by A. M. Dmitriyev, Z. B. Entin and N. I. Oleynikova, candidates of engineering sciences, NIITsement]

[Text] The material composition, hardening rate and strength are important indicators of the quality of cements. The Soviet cement industry is interested in comparing the requirements concerning these indicators of GOST [State Standard] 10178-76 (and partially GOST 22266-76) with the requirements contained in standards of certain foreign countries.

The general trend is toward expansion of the assortment of cements by using admixtures (Table 1), and as a result "Portland cement with mineral admixtures" has made its appearance in the standards of many countries. The content of admixtures in this cement is limited to 35 percent by the standards of France and Spain, while GOST 10178-76 (depending on the type of admixture) sets limits between 10 and 20 percent, which corresponds to the standards of most CEMA member countries.

In the standards of West Germany, Japan and Czechoslovakia the variety of the binder elsewhere referred to as "Portland cement with mineral admixtures" has not been provided for, but Portland-slag cement and Portland-pozzolan (ash) cement are divided into subvarieties with a moderate content of admixtures: up to 30 percent (Japan), 35 percent (West Germany) and 40 percent (Czechoslovakia), and also into subtypes with high content of admixtures--up to 60-80 percent.

The nomenclature item "Portland cement with mineral admixtures" has also been envisaged by ISO Recommendation R597.

In the standards of most countries the term "Portland cement" refers to straight cement. A new Soviet standard (GOST 10178-76) and also the standards of most of the CEMA member countries does not allow admixtures to this type of cement, but it is allowed by the standards of Australia, Finland and Poland.

Permission to include admixtures in small amounts to straight Portland cement without changing its name should be regarded as a new direction. The aim here is to improve the structural engineering properties of cement and concrete or to make the grinding process easier, which is indicated by the explanation to this effect in the standards. Addition of up to 5 percent admixtures to Portland cement was first envisaged by the standards of East Germany and West Germany.

Table 1

	Content of Active Mineral Ingredients, %, in			
Country	Portland Cement	Portland Cement With Admixtures	Portland-Slag Cement	Portland-Pozzolan (ash) Cement
USSR	--	Up to 20	21-80	20-40
Hungary	--	Up to 20	Up to 40	No st.
GDR	Up to 5[1]	Up to 20	20-40, >40 or >55	30-60
Bulgaria	--	Up to 20[2]	20-40	20-40
Poland	Up to 20	No st.	30-80	20-40
Romania	--	Up to 15[2]	Up to 30 or 50	No st.
Yugoslavia	--	Up to 30	31-85	>30
Czechoslovakia	--	No st.	Up to 40 or 40-80	No st.
Austria	Up to 15	No st.	16-30 or 31-85	No st.
Great Britain	--	No st.	Up to 65	No st.
Spain[3]	--	Up to 35	60-75 or >80	30-40
United States	--	No st.	25-65	15-40
Finland	Up to 15	No st.	Up to 30 or 30-65	No st.
France	--	Up to 35[4]	60-75 or >80	30-40
West Germany	Up to 5[1]	No st.	Up to 35 or 35-80	20-40
Japan	--	No st.	Up to 30, 30-60 or 60-70	Up to 10, 10-20 or 20-30

Notes: 1--amount of inert admixture; 2--including limits of 7.5 percent (Bulgaria) and 5.0 percent (Romania) on inert admixture; 3--the data are given from sources in the literature; 4--addition of inert admixtures is allowed; "No st."--the cement is not covered by a standard.

The standards of a number of countries (GDR, West Germany and France) allow inert admixtures to be used, which is another new direction. The experience of the Soviet cement industry in the past, as well as research conducted by NIITsement, indicate that adding, say, quartz sand in small amounts contributes to improved grinding of the clinker, reduces the cement's water requirement and hardly reduces its strength at all [1].

Though the standards of Great Britain, the United States and certain other countries do not allow the use of additives in Portland cement [2, 3], and the production of straight cement is still high, the interest in manufacturing cements with admixtures in those countries and the setting of standards concerning them is being manifested to an ever greater degree, especially in the United States. The production of these cements is regarded as promising because of the lower fuel and energy costs [4]. The production of masonry cement is also increasing in the United States [5].

Table 2

Country	Portland Cement and Portland Cement With Mineral Admixtures	Portland-Slag Cement and Portland-Pozzolan (ash) Content
USSR	400, 500, 550 and 600	300, 400 and 500
Hungary	400, 500 and 600	300, 400 and 500
GDR	400, 450-500 and 550	300-350
Bulgaria	400, 500 and 600	300 and 400
Poland	300, 400, 500-550 and 600	300 and 400
Yugoslavia	350, 450 and 550	250, 350 and 450
Czechoslovakia	350-400, 450 and 500-550	250, 300, 350-400 and 450
Great Britain	400 and 550	350
United States	400 and 500-550	400
France	300-350, 400-450, 500-550 and 600	300-350, 400-450 and 500-550
West Germany	400, 550 and 600	300, 400, 500 and 550
Japan	400, 500 and 550-600	300 and 400

Note: The figures on grades of cements are given so as to take into account their strength in tests conducted according to GOST 310.4-76.

The grade strength of cements in comparable values (taking into account their strengths at different intervals and testing methods covered by GOST 310.4-76) is given in Table 2.

An analysis of these figures shows that the standards concerning grade strength of cements have in recent years risen in the standards of the USSR (1976), Great Britain (1978), Japan (1977), the United States (1977), France (1976), Poland (1974), and Hungary (1974). The present trend in the standards of various countries is to adopt higher requirements for high-strength cements (Grades 550 and 600). It follows from the figures in Table 2 that the requirements of GOST 10178-76 with respect to grade strength are on the level of the requirements of the new standards of Hungary, Poland, France, West Germany and Japan, but they exceed the requirements of standards in Great Britain, the United States and Yugoslavia.

Along with high-strength cements, whose production from country to country ranges from 1 to 4 percent of total output [6], the standards of all the advanced countries make provision for ordinary cements similar to Grades 300 and 400 (GOST 310.4-76), which account for the bulk of the output. The total number of cement grades in the standards of most countries is 3-4.

Limiting the assortment of cement to 1-2 classes with respect to strength (Great Britain and the United States), just like the absence of a standard governing grade strength (the United States), cannot be viewed as factors that are constructive from the standpoint of setting standards for cements in those countries. A standard concerning grade strength has for the first time been adopted in a standard of Great Britain (British Standard 12:1978).

The strength standards of cements, which correspond to the testing methods referred to in the national standards, make it possible to trace a trend toward more rigid requirements concerning their hardening rate, as given in part in Table 3. This greater stringency is manifested in the setting of standards concerning the strength of fast-curing cements at less than 3 days (GDR, Poland, United States, West Germany, France, etc.) and in the higher absolute values for strength (USSR, United States, Great Britain, etc.). The setting of strength standards at 3 days for fast-curing cements has been retained in GOST 10178-76 and the new standards of Great Britain and other countries.

The figures in Table 3 show that some countries (Great Britain, United States, West Germany, etc.) have refrained from setting a flexural strength (tensile strength) standard. The standards of a number of countries have stipulated new conditions for guaranteeing the grade strength of cements. Of greatest interest in this respect are the standards of France and West Germany, in which the guarantee of the strength characteristics of the cement is based on the results of statistical monitoring.

According to the French standard, the average strength of cement must be only a bit higher (5-10 percent) than its grade. Strength may drop in certain lots to 100 kilogram-force per square centimeter below the nominal grade strength provided that the distribution curve of the strength is characterized by a 90-percent reliable probability for the lower limit (at 100 kilogram-force per square centimeter below the grade) and 90 percent for the upper limit (at 100 kilogram-force per square centimeter above the grade). Taking this into account, the guaranteed strength for Grade 450 is 350 kilogram-force per square centimeter.

In the Polish standard the lower limit set on cement strength exceeds the value of the grade by 25 kilogram-force per square centimeter. At the same time the standards of the GDR and Yugoslavia allow for cement strength to drop 2.3 and 10.0 percent, respectively, below grade strength.

Highest strength of cements in a particular grade is envisaged by the standard of West Germany; here the grade of the cement indicates the minimum value of its strength; the average strength of the cement is approximately 100 kilogram-force per square centimeter higher than its grade.

In the standards of most countries the figure for the grade strength of the cement is the lower limit of its strength, and that is also true in GOST 10178-76.

Table 3

Country and Standard	Type of Cement	Grade (strength class of cement)	Strength, kg-force/cm^2 Tensile Strength, days			Compression Strength, days			Remarks
			3	7	28	3	7	28	
1	2	3	4	5	6	7	8	9	10
USSR GOST 10178-76	Portland cement (straight) and Portland cement with mineral admixtures	400	--	--	55	--	--	400	Composition of cement-sand mixture Cement:sand = 1:3 Water:cement = 0.4
		500	--	--	60	--	--	500	
		550	--	--	60	--	--	550	
		600	--	--	65	--	--	600	
	High-early Portland cement	400	40	--	55	250	--	400	
		500	45	--	60	280	--	500	
GDR TGL 28101/91	Portland cement PZ1	375	--	--	--	175	--	375	Cement:sand = 1.3 Water:cement = 0.5
		425	--	--	--	250	--	425	
		475	--	--	--	150^1	--	475	
	Portland cement with admixtures (PZ7 and PZ8)	375	--	--	--	175	--	375	
Poland PN 74/B-3000 PN 74/B-30006 PN 74/B-30011	Portland cement PN 74/B-3000	250	--	33	53	--	155	275	Cement:sand = 1:3 Water:cement = 0.5
		350	28	43	63	155	250	375	
		450	43	58	73	205	305	475	
		550	50	60	80	250	400	550	
	High-early Portland cement PN 74/B-30006	400	$28/48^2$	--	68	$125/225^2$	--	425	
	Super high-early cement PN 74/B-30011	400	$40/50^2$	--	70	$175/275^2$	--	400	
		500	$25/45/55^3$	--	75	$100/250/350^3$	--	500	

Table 3 (continued)

1	2	3	4	5	6	7	8	9	10
Yugoslavia JUF B. Cl. 011 (1976)	Portland cement and Portland cement with admixtures	250	--	30	40	--	140	225	Cement:sand = 1:3 Water:cement = 0.5
		350	--	40	50	--	200	315	
		450	35	--	55	180	--	405	
		550	35[1]	--	60	180[1]	--	495	
Great Britain B.S. 12:1978	Portland cement	--	--	--	--	234	--	418	Cement:sand = 1:3 Water:cement = 0.4
	High-early Portland cement	--	--	--	--	295	--	469	
United States ASTM C 150-76a	Ordinary Portland cement (Type I)	--	--	--	--	124	193	--	Cement:sand = 1:275 Water:cement = 0.49
	High-early Portland cement (Type III)	--	--	--	--	124/ 241[2]	--	--	
France NFp 15=301-1976	All types	350	--	--	--	--	100	250/ 450[5]	Cement:sand = 1:3 Water:cement = 0.5
		450	--	--	--	--	175	350/ 550[5]	
		450R (high-early)	--	--	--	100/ 150[4]	--	350/ 550[5]	
		550	--	--	--	100	--	450/ 650[5]	
		550R	--	--	--	150/ 225[4]	--	450/ 650[5]	
		550THR (high-early)	--	--	--	200/ 300[4]	--	550	

Table 3 (continued)

1	2	3	4	5	6	7	8	9	10
West Germany DIN 1164-70	All types	250	--	--	--	--	100	250/ 450[5]	Cement:sand = 1.3 Water:cement = 0.5
		350L	--	--	--	--	175	350/ 550[5]	
		350F (high-early)	--	--	--	100[6]	--	350/ 550[5]	
		450L	--	--	--	100[6]	--	450/ 650[5]	
		450F	--	--	--	200[6]	--	450/ 650[5]	
		550	--	--	--	300[6]	--	550	

Notes: e figures on the strength of cements whose hardening periods do not coincide with those in e table: 1--after 1 day of hardening; 2--in front of the slash--after 1 day, after the slash--after 3 days; 3--after intervals of 12 hours, 1 day and 3 days; 4--after 2 days, before the slash--minimum guaranteed strength, after the slash--upper statistical limit; 5--in front of the slash--minimum guaranteed strength, after the slash--upper statistical limit; 6--after 2 days.

Conclusions

At present we note a trend in the setting of cement standards toward expansion of the assortment of general construction cements thanks to incorporation of admixtures in them, including inert ingredients.

The standards provide both for high-strength and ordinary cements.

For high-early cements standard strength is given at 3 days, and higher requirements are being set for its absolute values.

The standards of the USSR (GOST 10178-76 and GOST 22266-76) are in line with the present-day directions in the setting of standards on general structural cements in the technically advanced countries. Certain indicators of the quality of cements envisaged by Soviet standards (the assortment of cements by strength classes, including ordinary and high-strength cements, and the optimal use of admixtures) are a subject of study and orientation in the development of standards for many countries.

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Development of Dry Process

Moscow TSEMENT in Russian No 12, 1979 pp 17-18

[Article by V. N. Lyamin, chief engineer of VNIItsemmash [All-Union Scientific Research Institute of Machinery for the Cement Industry]]

> [Text] The article by Giprotsement director N. F. Ananenko entitled "Creating All the Conditions for Rapid Development of the Dry Process of Cement Production," published in the journal TSEMENT, No 3, 1979, and the comments by the editors touched upon important issues in the development of the industry and cement machinebuilding. As a contribution to the discussion of these issues certain proposals are presented here concerning improvement of equipment for production of cement by the dry process.

Five production lines using the dry process with an output of 3,000 tons of clinker per hour are now in operation at the Novokaragandinskiy, Novospasskiy and Navoi cement plants. Even now it is possible to sum up the results of operation of the equipment of the new production lines.

It has become obvious that the 6.4 x 95-meter kilns with cyclone heat exchangers have a sizable reserve capacity, but it does not seem possible to fully utilize them because of the limited capacity of the related equipment. Another significant factor that has an adverse effect on operating reliability and the utilization time of these kilns is the low resistance of their lining because of their large diameter. There are reasons to suppose that this larger diameter, coupled with the excessive narrowing of the discharge portion is one of the reasons why the material in the kiln disintegrates excessively, forming a large number of dusty fractions in the clinker. This has an adverse effect on the reliability and heat-engineering efficiency of the gratings used to cool the clinker, and there is more dust irrecoverably carried away with the excess air used for cooling.

Jointly with the Novospasskiy Cement Plant VNIItsemmash has redesigned the discharge end of the kiln so as to increase its diameter and diminish its conical shape. These units are being manufactured by the Volgotsemmash Plant.

The design features of the loading end of the kiln and of its packing have been tested at a number of cement plants in several structural modifications. The most successful designs must be chosen and applied to all the kilns in operation.

Of the plants at which the new production lines are in operation the greatest success in mastering the equipment has been achieved by the collective of the Novospasskiy plant, where the rated hourly output of the 6.4 x 95-meter kilns has already been surpassed. This is no accident; by the time the new production lines were started up at this plant a collective which had acquired a great deal of experience in adjusting and operating production lines for the dry process with a lower output had already been built up at the plant.

At the same time the startup of the closed-circuit grinding unit, consisting of a 4 x 13.5-meter mill, a cyclone separator with a diameter of 5 meters, and an SMTs-130A elevator, was delayed unjustifiably. Work was done slowly on reconstruction of the grinding operation consisting of the 9.7 x 3.3-meter dry self-pulverizing mill, which has a tailings separator and other units.

The opposite situation came about at the Navoi plant, where the collective was just being put together and there was an acute shortage of experienced specialists. The organization of a school for advanced know-how at the Novospasskiy plant has had a constructive role for all the plants. At this enterprise the system was adjusted for spraying water into the cooler, several units of the cyclone heat exchangers were perfected, units were adopted for monitoring the temperature of the kiln housing, the system of feeding cooling air into the cooler was reorganized, adjustments were made in the SMTs-101 bag filters and a method was worked out of lining the loading cone of the kiln with heat-resistant concrete, etc. But at the same time we must take into account the constructive solutions of the other cement plants as well. For example, we might mention here the experience with the inclined cooler gratings developed by VNIItsemmash, which were adopted at the Novokaragandinskiy and Navoi plants, and the improved threshold plates at the discharge ends of the kilns and the strengthened mantle of the cooler, for which the Navoi plant deserves credit.

In the near future the task will arise of maximum utilization of the output potential of the 6.4 x 95-meter kilns. There are several ways of solving this problem:

i. maintaining the present size of the kiln and elements of the cyclone heat exchangers, while increasing the output of the kiln to 4,000-4,200 tons of clinker per day;

ii. maintaining the diameter of the kiln, but increasing its length to 110-115 meters and modifying somewhat the cyclone heat exchangers to bring output up to 5,000 tons of clinker per day.

A further increase in output is possible if a decarbonization unit is included as part of the kiln unit.

In both cases it is necessary to increase the capacity of the grinding units, the mixing and auxiliary equipment, the exhaust-blast equipment, and conveyor equipment. The variant for redesigning the kiln unit should be chosen so as to take into account the specific conditions of the particular cement plant.

The most complicated unit of all the equipment in the production lines is the clinker cooler, whose assemblies and parts are also subjected to intensive heat and mechanical stresses. It is not surprising, then, that a great number of shortcomings have been detected in operating the experimental SMTs-83 coolers. The steps necessary to perfect the coolers are these:

i. reduction of the cross section of the grating;

ii. use of a movable inclined grating in the loading shaft of the cooler;

iii. more reliable air seal of the chambers beneath the grating;

iv. reinforcement of the flight conveyors for removal of the spill and replacement of the forged scraper links with cast links;

v. individual feed of cooling air to the chambers beneath the gratings from independent fans;

vi. increased capacity of the exhaust system of the cooler and installation of DRTs-21 x 2 exhaust fans;

vii. moistening of the exhaust air fed to the electrofilters by means of a system of high-pressure water nozzles.

In the operation and testing of units consisting of a 4.2 x 10-meter mill for grinding and drying raw materials of average grindability satisfactory performance and technical-and-economic results were confirmed at the Novokaragandinskiy and Navoi plants. The most important shortcoming discovered in that effort was the need to increase the starting moment of the electric motor supplying the main drive to the mill, replace the continuous separator with a diameter of 5.5 meters with a separator with a diameter of 6.5 meters, and reinforce the sluice gate.

In cases when the unit incorporating the 4.2 x 10-meter mill is used to grind raw materials with low natural moisture (a typical example of this is the raw material used at the Navoi Cement Plant) and when as a consequence there is no need to feed a large amount of hot gases to the mill to dry the material, it makes sense to use pneumomechanical instead of pneumatic unloading of the raw materials from the mill by installing an elevator and a cyclone separator.

This would make it possible to substantially reduce the specific consumption of electric power for moving the material. It would be wise to design such a version of the unit and later apply it when necessary.

During the adjustment and operation of the 9.7 x 3.3-meter dry self-pulverizing mill at the Novospasskiy plant it was found necessary to make the following structural improvements:

i. redesign of the unit for unloading the material and installation of a classifier to separate tailings from the dust-gas flow and installation of a mechanical conveyor system to feed it to the mill for additional grinding;

ii. reinforcement of the breaker plates and reduction of the height of the lifters on them;

iii. inclusion of Belleville spring washers in the assembly for fastening the breaker plates to the frame of the mill to compensate possible bucklings and deformations of the breaker plates;

iv. improvement of the design of the packing of the gear coupling used to transmit the torque from the compound reduction gear to the mill;

v. reinforcement of the sluice gate;

vi. development of a new drive for the mill with a ring gear fixed to the journal at the discharge end of the mill and two "following" pinions supporting the ring.

Once the 9.7 x 3.3-meter mill and the grinding operation as a whole have been adjusted and perfected, on the basis of the operating and testing results the capacity of the mill can be raised to 400-450 tons per hour, which means that it can be used in dry-process production lines with a capacity of 5,000 tons of clinker per day.

Other important questions are these:

i. thorough adjustment of the production processes of the kiln and grinding operations;

ii. assurance of optimum chemical composition of the components of the raw material mixture and the necessary degree of their averaging;

iii. adoption of comprehensive automatic control systems of the individual operations and automatic process control;

iv. the staffing of the production operation with competent personnel and an all-out effort to increase the level of operation;

v. uninterrupted supply of spare parts.

All the design improvements seen to be necessary during operation of the first five lines have still not been introduced for all practical purposes into the equipment of the three production lines at the Rezina, Navoi and Novokaragandinskiy plants, which is now being installed. It would be advisable to take the appropriate steps on all three lines so that the design defects are not repeated on them.

Along with perfecting the equipment of the high-capacity dry-process production lines, an equally important task is to develop new equipment for dry-process production lines with capacities of 3,000 and 5,000 tons of clinker per day furnished with decarbonization reactors. Plans call for the first lines to be built at the Krivoy Rog, Nev'yansk and Rezina cement plants.

A further increase in the production of cement by the dry process should occur not only and not so much by virtue of construction and activation of new enterprises, but mainly by virtue of reconstruction and conversion of existing wet-process production lines to the dry process.

We must concur in the proposal of the editors to the effect that the old-fashioned and inefficient wet-process kilns with low capacity (under 3.6 x 150 meters) should be the first to undergo modernization. The most effective method of reconstruction would seem to be furnishing these kilns with cyclone heat exchangers and a decarbonizer, which would make it possible to increase their capacity 2.5-3-fold. A number of other versions are also possible, including furnishing the kilns with three-stage cyclone heat exchangers. Selection of the variants for reconstruction in each specific case should coincide with local conditions on the basis of a comprehensive technical-and-economic computation. Consideration should also be given to the possibilities of using new manufacturing procedures, for example, low-temperature salt technology.

The bottleneck during such reconstruction projects is always installation of the clinker cooler, since usually they cannot be fitted into the structural designs of existing shops, and that raises the problem of building coolers which are small in dimensions. This problem is solved most effectively by developing and applying grating coolers and force-fed cooling air (rotary, gravity and chain).

So, the following steps are required for further improvement of equipment for dry-process cement production:

i. completion of the adjustment and redesign of the equipment at the production lines already in operation or now being installed;

ii. development and introduction of equipment of production lines using decarbonization reactors with capacities of 3,000 and 5,000 tons of clinker per day;

iii. modernization and improvement of the capacity of 6.4 x 95-meter kilns;

iv. modernization of the 9.7 x 3.3-meter dry self-pulverizing mill and boosting its capacity to 400-450 tons per hour;

v. reconstruction of wet-process kilns and their conversion to the dry process;

vi. development of small-size grating coolers.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

MOSCOW CONSTRUCTION MAIN ADMINISTRATIONS LAGGING

Moscow MOSKOVSKAYA PRAVDA in Russian 24 Nov 79 p 2

> [Text] All Moscow gorispolkom main construction administrations are meeting plans in terms of amount of construction-installation work and marketing commodity output. The Glavmosstroy [Main Administration for Housing and Civil Engineering Construction in Moscow] is lagging in carrying out the plan for starting up housing, children's preschool institutions, and public-health, trade and public catering facilities. Enterprises of the Glavmosmontazhspetsstroy [Main Administration for Installation and Special Construction in Moscow] are delaying deliveries of structures and items for a number of important start-up projects.

Builders, planners and construction industry workers in the capital are resolving important tasks in the fourth year of the five-year plan. An ambitious program of capital construction must be implemented. Muscovites know that construction work on Olympiad-80 projects must basically be completed this year without reducing the rates of construction of housing, social-, cultural- and personal-services facilities or the rates of industrial enterprise renovation and retooling. Success in carrying out the five-year plan for the socioeconomic development of Moscow will depend in large measure on how the construction program is carried out this year.

Quite a bit is being and has been done. During the first 10 months of this year, two percent more capital investments have been utilized than were used in the same period last year. Twenty school buildings, 2.86 million square meters of housing 139 trade and public catering enterprises, and many other facilities have been put into operation. Several large Olympics projects have been completed.

However, the start-up of many projects scheduled for completion is now being planned for the end of the year due to shortcomings in planning, construction and supply. This complicates considerably the work of collectives of builders, construction industry enterprises and numerous specialized subdivisions.

Under such circumstances, particular precision is demanded of leaders of all ranks and party organizations in managing construction production, as is the ability to mobilize laborers to achieve concrete results. The data indicate, however, that economic leaders and party organizations have not always been able to set up smooth work in their collectives, administrations, sectors and brigades.

The work of Glavmosstroy subdivisions is now eliciting quite a few reproofs. As checks have shown, an atmosphere of mobilization has not been created in the very apparatus of this very large main administration. It would seem necessary for the central apparatus party committee (Secretary I. I. Kudinov) to increase its demandingness of communists working here.

Ministries and departments are carrying out quite a large proportion of the capital's housing construction program. Unfortunately, the leaders of many of their subordinate enterprises are poorly supervising work on housing structures being built and are not helping provide them with full sets of components. The greatest lag has been permitted by enterprises of the Ministry of Automotive Industry, the Znamya Truda, Krasnyy Oktyabr' and Znamya plants, the No 1 State Bearing Plant, and the Automobile Plant imeni Lenin Komsomol. At many housing structures which must be put into operation this year the ministries and departments have still not installed the full amount of surface utilities; work on putting in roads and public amenities is not complete.

On the whole, the capital's Olympics construction plan is being carried out successfully. At the same time, the work tempo slowed in October at a number of projects. In particular, subdivisions of the Mosstroy trusts Nos 2, 8 and 28 are behind schedule in releasing premises for equipment installation. Mosfundamentstroy Trust No 8 and Mosstroy Trust No 14 are late in providing their projects with public amenities. Several construction sites have not been provided with a permanent electric power supply. The reasons are known: inadequately precise organization of worker labor, failure to give subcontractor organizations work fronts at the proper times, and the failure to prepare a number of facilities for work under winter conditions.

A large program has been planned for this year for the start-up of projects for light, food and meat-dairy branches as well. On the whole, the contractor work plans for these projects are being carried out. A number of projects have already been put into operation and work is being completed at many others. The new knitting building at the Trekhgornaya Manufaktura Factory, for example, is in a high state of readiness. However, delay has been permitted at a number of Group B construction sites. The Glavmospromstroy [not further identified] is not carrying out the program at light industry construction sites. The Mosstroy No 8 Trust (manager L. B. Shul'man) and the Mosstroy No 20 Trust (manager V. N. Ponamarev) of this main administration have not carried out the plans at four and two such construction sites, respectively, and the No 1 State Construction-Installation Association (chief V. I. Kuznetsov) -- at seven.

During this taut period, construction success will depend largely on the precise provision of sites with complete sets of all the needed components, items and equipment. Signals from builders that manufacturing schedules are not being met by enterprises of the Glavmosmontazhspetsstroy for metal and aluminum components, that delivery schedules are not being met by this main administration for sanitary-engineering, electrical-engineering and ventilation items and stocks, and that equipment is substandard are now increasing in frequency. This main administration's Mossantekhprom Association (Director M. V. Plakhov) is late in delivering pipe and ventilation stocks to Mossantekhstroy trusts Nos 1, 2 and 6 of the Glavmosstroy, as a result of which a whole series of start-up projects of this main administration have not been provided with sets of these stocks; these include department stores, a polyclinic, a hospital and kindergartens. The association is also late in delivering supplies to the Mar'inskaya Poultry Factory, an important start-up project. Another association in this main administration, the Mosmetallokonstruktsiya (Director V. G. Astaulov) has also failed to supply a number of important start-up projects with components. The main administration's collegium must increase its demandingness of leaders of its subdivisions for filling the orders of start-up construction projects fully and promptly.

Builders also have a number of claims against leaders of subdivisions of the Glavmosavtotrans [Main Administration of Motor Transport of the Moscow Gorispolkom]. For example, given a scheduled 650 vehicles per day for construction sites of the Glavmosstroy, transport workers are allocating an average of 540 vehicles. Fewer vehicles than needed are being allocated for hauling reinforced concrete items from enterprises of the Glavmospromstroymaterialy [Main Administration of Building Materials and Structural Parts Industry of the Moscow Gorispolkom]. Transport workers are also in great debt to construction workers in terms of morning runs at slurry mixing sites.

It is a matter of honor for the collectives of builders and construction-industry enterprises to successfully complete the year by putting into operation all projects outlined in the plans and socialist obligations.

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MOSCOW CONSTRUCTION RESEARCH INSTITUTE HELPS HOUSE-BUILDERS

Moscow STROITEL'NAYA GAZETA in Russian 16 Dec 79 p 3

[Article by F. Belavin, Candidate of Technical Sciences and Chief of the Prefabricated House Construction Laboratory of the NIIMosstroy (Scientific Research Institute of the Glavmosstroy [Main Administration for Housing and Civil Engineering Construction in Moscow]): "The Institute Working for the Combine"]

[Text] One can see the elegant new P/Z-16-series 16-story houses being put up by the No 3 House-Building Combine in various sections of Moscow.

The DSK-3 [No 3 House-Building Combine] collective has set itself the task of building and releasing for occupancy houses in this series with the state Badge of Quality. The collective of the NIIMosstroy is helping the house-builders attain that goal. A plan for joint scientific research has been drawn up. A joint order has been issued by four main administrations of the Moscow gorispolkom -- the Glavmosstroy, the Main Architectural Planning Administration, the Glavmospromstroymaterialy [Main Administration of Building Materials and Structural Parts Industry] and the Glavmosmontazhspetsstroy [Main Administration for Installation and Special Construction in Moscow] -- to coordinate the schedules for implementing particular measures.

Ventilation units, for example, previously caused builders much concern. Irregularities and other defects are created on butt surfaces during transport and when forms are struck; this makes it hard to get a good seal at the joints. In this case, laying down braided packing does not help. The brigade of Hero of Socialist Labor I. Demin turned to institute associates for help. After a detailed study of the problem, the prefabricated house-building laboratory suggested a stock sheathing to level the upper edge of ventilation units being installed. Plant workers made a prototype and an experiment was conducted at Olympic Village sites. The results were excellent. Such sheathing will now be used at other projects.

Finishing work is among the most labor-consuming type of construction work. It is therefore understandable how much importance is attached to mechanizing it, to introducing new and more effective materials. NIIMosstroy

Finishing Work Laboratory associates A. Bulychev, T. Usatova and Yu. Luk'yanov worked out the composition of outer wall panel front surface primer manufactured using SP-50 latexes. It is considerably easier to work with the new material, and the quality of the finishing work is higher.

There have also been innovations in finishing kitchens, elevator entrances and apartment corridors: wallpaper is covered by a modified latex of the same type. This reduces labor expenditures and finishing-work time; it increases the water resistance of the wallpaper and improves the appearance of the area.

Other institute subdivisions also cooperate actively with house builders. Ye. Artykpayev, chief of the physical research methods laboratory, N. Balandin, chief of the acoustics sector, and senior associate M. Akutova made specific recommendations on how to improve the heat-engineering and sound-insulation properties of claydite-concrete enclosures. Production testing and research laboratory associates systematically check the condition of reinforced concrete elements and monitor the quality and strength of slurry.

The scientific research institute's prefabricated house-building laboratory studied outer wall panel and between-floor overlap panel platform butt joints. Recommendations were drawn up on how to improve the reinforcement of ceiling panels, and by using low grades of concrete as well. The new panels are already arriving at construction sites. Their use will enable the combine to save 1,200 tons of reinforcement steel and 1,500 tons of cement annually. These items have been awarded the state Badge of Quality.

Heretofore, the manufacture and installation of shower stalls has been far from perfect. Because of various defects, it is often hard to fit the stand pipes. At the request of DSK-3 fitters, S. Byvshev, chief of the engineering equipment laboratory, and his associates are studying this problem and trying to simplify the method of connecting the pipes when installing shower stalls.

Housing quality must not be seen in isolation from the surrounding site. The road construction laboratory offered the combine ideas for making the amenities in courtyards of high quality as well. L. Gorodetskiy and V. Kononov advised it to use curbstones made of sandy concrete for intra-apartment walkways and a light-colored "dorsil" artificial gravel. For temporary roads, it is advantageous to use stock prestressed slabs.

The creative cooperation between the NIIMosstroy and DSK-3 continues. It is helping to reduce research time, the concluding stage of the research now being done right in the shops of reinforced concrete components plants or at construction sites. Innovations are introduced into construction faster.

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GLAVMOSMONTAZHSPETSSTROY CHIEF ON NEW ORGANIZATIONAL STRUCTURE

Moscow STROITEL'NAYA GAZETA in Russian 9 Jan 80 p 2

[Interview with Glavmosmontazhspetsstroy Chief V. Kovalev: "Production and Installation -- Together"]

> [Text] The Glavmosmontazhspetsstroy [Main Administration for Installation and Special Construction in Moscow] was created in Moscow three years ago. Subordinate to it are 58 collectives of enterprises and organizations of designers, manufacturers of components and equipment, fitters and repairmen. Three years is not a long time, but it can already be stated with confidence that the creation of a single industrial-installation complex has justified itself. During those three years, the average annual rate of gross output increment has been 4.1 percent and the volume of industrial production has increased 20 percent. Nearly 80 percent of the increment in production volume has been obtained through labor productivity growth. The amount of construction-installation work done through our own efforts has increased by 10 percent annually. Our correspondent talked with Glavmosmontazhspetsstroy chief V. Kovalev about features of the new organizational structure.

[Question] Judging from the composition of the subdivisions comprising the main administration, the new organizational structure is oriented towards doing work on the basis of a finished cycle. That is, the planning, industrial manufacture of equipment and components, their installation and adjustment have been concentrated in a single organization. What production necessity caused this?

[Answer] Modern buildings are increasingly like complex technical installations. They would be inconceivable without elevators, ventilation systems, electrical-engineering, sanitary-engineering and other equipment. It is very important that they be installed in a technological sequence. But, inasmuch as this work is generally done by different, specialized organizations, it is not easy to coordinate their actions. Each has its own tasks and interests, and it often happens that the way in which their activity is organized conflicts with the primary task of putting the project into operation promptly.

Our organizational structure removes these conflicts. We are already building elevators, district heating centers and transformer substations on the basis of a finished cycle. Indifidual types of work are also being done following this same principle, as for example at 65 dining halls for Olympiad participants, with the use of steel components. They were designed by the Mosspetspromproyekt association, manufactured by the Mosmetallokonstruktsiya association and installed by the Mospromontazh trust. Aluminum components are being installed in similar fashion at another Olympics project, the hotel complex in Izmaylovo. Main administration installation organizations have already installed more than two-thirds of the steel and shaped components manufactured at our enterprises.

[Question] What organizations are involved in developing the estimate-planning documentation?

[Answer] Our largest lead planning organization is the Mosspetspromproyekt [not further identified] association. It is comprised of 36 independent departments which develop estimate-planning documentation for the renovation and retooling of sectors, shops and enterprises; they are involved in designing various types of equipment, rigging, attachments and tools, as well as in standardizing and developing technical-normative documentation.

This association is collaborating with more than 60 scientific research, planning-design and academic institutes of other ministries and departments, which enables it to successfully solve problems of increasing production efficiency. For example, standardized steel stained-glass components, balcony railings, loge railings, handrails and platforms used in 17 series of large-scale construction housing were developed jointly with the plants and the MNIITEP [not further identified].

During 1978-1979, the association produced 120 plans for specialized construction and installation-adjustment work in erecting single-purpose buildings and structures in the capital. Planning-design groups of the Mosmetallokonstruktsiya, Mospromelektrokonstruktsiya and Mosstroykonstruktsiya associations are developing routine documentation to meet the needs of city construction.

[Question] One of the basis tasks of fitters is to increase the degree of plant readiness of items and to reduce the amount of installation work at construction sites. How are you solving that problem?

[Answer] We are trying to follow the principles of concentrating and specializing industrial production. The collective of the Karacharovskiy Machine Shop has achieved great success in this direction. Increased elevator prefabrication and their greater plant readiness have already provided more than a million rubles in savings. Elevator production is now being done using conveyors for the first time here. The plant quickly set up the production of high-speed elevators for tall buildings, which has permitted us to avoid purchasing them abroad. However, as a whole, the production capacities of the enterprises are still inadequate. Slow rates of installation of aluminum and steel components plants in Vidnyy are especially alarming.

[Question] What technological innovations is the main administration paying particular attention to?

[Answer] An experimental construction administration has been organized in the Mosstroykonstruktsiya association to put up buildings and structures made with slab reinforced concrete. In 1978, it did about a million rubles worth of work, and last year the amount doubled. Slab reinforced concrete is used to install buildings of the most varied types: a swimming pool and stadium, an underground garage and automated telephone exchange, housing. In the garage and housing construction alone, replacement of prefabricated reinforced concrete with slab reinforced concrete enabled us to save 300,000 rubles.

We are paying a great deal of attention to introducing metal-frame plaster partitions. A special construction administration has been organized in the Mosprommontazh trust to produce and install them. Last year, the volume of such work increased three-fold. Given new technology, it will no longer be necessary to use small-item materials and wet methods in finishing. Every 100,000 square meters of plaster partitions installed frees about 500 finishing workers for other work.

To meet builders' needs we are manufacturing a large number of new construction machinery, means of small-scale mechanization and equipment which are not being released by the country's industrial enterprises.

Actualization of the general plan for the capital of our homeland sets us complex new tasks and, in order to cope with them successfully, we will have to constantly perfect the forms of construction management, improve output quality and increase the efficiency of industrial production and construction.

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MOSCOW GLAVUKS CONSTRUCTION ADMINISTRATION

Moscow STROITEL'NAYA GAZETA in Russian 13 Jan 80 p 2

[Article by Honored Builder of the RSFSR I. Boltovskiy, chief of the Moscow gorispolkom's GlavUKS (Main Administration for Capital Construction): "All the Threads of Management"]

[Text] The Moscow Gorispolkom Main Administration for Capital Construction was created 13 years ago. Our capital is the first city in the country to be served by a single client for installing housing, administrative buildings and facilities for education, public health, trade, cultural and personal services.

In 1973, the Moscow City Soviet also entrusted the GlavUKS with the functions of client for the construction of city utilities, foreign representation, single-purpose facilities; these included the Vazuzskaya and Rzhevskaya hydraulic-engineering systems, the Center for International Trade and Scientific-Technical Ties With Foreign Countries, and the hothouse combine in Stavropol'skiy Kray.

The following year, the USSR Council of Ministers decided to make the GlavUKS the sole construction project manager in the capital. Today, 300 other organizations besides it perform this role as well.

In the 1950's and 1960's, Moscow was built up independently by upwards of a thousand clients. They all strove for the same thing, to build housing. Cultural and personal services facilities and public health facilities appeared in the microrayons two years later, at the earliest.

During its existence in the capital, the amount of capital investment concentrated in GlavUKS hands has grown 2.5-fold, from 450 million to 1.1 billion rubles. A purposeful urban construction policy has permitted their more appropriate distribution among the branches, comprehensiveness of development, providing sites with utilities at outstripping rates, and a reduction in the amount of unfinished construction. Last year, for example, 80 percent of the capital investments was directed into start-up projects.

During its 13 years, the GlavUKS has utilized upwards of nine billion rubles. More than 40 million square meters of housing, general educational schools for 253,000 pupils, preschool institutions for 126,000, polyclinics for 89,000 visits, 26,516 hospital beds, 61 automated telephone exchange buildings, 155 stores, 24 movie theaters, fruit and vegetable bases to handle 444,000 tons, some 2,146 kilometers of city underground utilities, and 3,782,000 square meters of city roads and highways have been put into operation.

Even given this astonishing volume of work, the number of apparatus workers in this single-client administration is 25-30 percent below normative, providing an annual savings of on the order of two million rubles. The GlavUKS structure looks like this today. Eight territorial UKS's have been created based on the number of planning zones in the capital; their primary task is to ensure the comprehensive, smooth development of residential areas and blocks. Moreover, seven branch administrations and an equal number of specialized administrations have been organized to install, for example, facilities for education, trade, public health, culture, and so on. The specialists in these subdivisions have studied the requirements of branch economies thoroughly and comprehensively, which enables them to correctly plan their development, to introduce innovations, and to effectively exercise authorship supervision.

The GlavUKS finances 96.5 percent of the housing built in the capital by the contract method. In this regard, upwards of 200 organizations have proportionate participation in its creation. The procedure for them is fixed as follows. The amount of their proportion is reviewed and determined by the Moscow City Planning Commission; then a Moscow gorispolkom commission approves the site distribution plan. Only after this are the funds transferred to the GlavUKS account.

The amount of proportionate participation in the construction of intra-apartment utilities is determined by the client, and of city utilities -- by the GlavAPU [Main Architectural Planning Administration for Moscow] department of subsurface installations, jointly with operation services. Some 155 organizations participate in creating the Moscow engineering economy.

For cultural, personal-services and administrative construction, the amount of capital investments accepted is coordinated between ministries and departments and the GlavUKS. This past year, we received funds from 64 organizations for these purposes. On the whole, about 500 contract shareholders transfer 200-220 million rubles in capital investment annually to the GlavUKS.

Three years ago, the GlavUKS changed over to two-year planning for design work, housing construction, cultural- and personal-services construction. The two-year planning system is of enormous importance to Moscow. The fact is that in both the current and future five-year plans, sites requiring considerable preparatory work are being set aside for large housing developments:

withdrawing land from agricultural use, rerouting electric power lines, eliminating dumps, removing industrial enterprises, pulling down a considerable number of houses with few stories, and so on.

In 1978, a construction preparation administration was created in the GlavUKS for this purpose. This year, it is to relocate more than 14,000 persons from dilapidated buildings, relocate 123 organizations and grade 1.5 million cubic meters of earth. Sites in Mar'ina, Nagatinskiy Cove, Businovo, block 35 in Yuzhnyy Tushin, Rabochiy Poselok and elsewhere are being readied for development.

Strogino is one example of the creative cooperation between a single client and builders. A decision was made in April 1977 to create a housing development here. More than 2,000 people had to be relocated, about 500 structures taken down, a high-pressure gas main and 900-mm diameter water main relocated for a 375 ha site. Site preparation began in October and builders were already being given a broad work front by April 1978.

And they enlarged that front with all their might. This year, the rayon is basically complete. New residents will receive 1.3 square meters of housing here. By comparison, about 800,000 square meters of housing was built in Zelenograd over a 10-year period.

The GlavUKS is constantly concerned with fundamentally improving the architectural appearance of new capital rayons. A construction quality control department has been created in the main administration. Although the range of problems with which department associates are concerned is determined by the name of the department, they are also participating very directly in solving problems of comprehensive site development; they facilitate raising the architectural level of the plans and improving technical supervision and they participate in certifying the output of Moscow house-building combines.

Currently, more than half the houses in the capital are being assembled from items in the Unified Standardized Catalog. They are superior to their predecessors -- standard buildings -- both in terms of facade plastic and finishing and apartment lay-out. In the 11th Five-Year Plan, such houses will comprise three-quarters of the total. In connection with the shortage of free sites, their height will be increased from 16 to 22 stories.

A single-client service would be inconceivable without subdivisions involved in supplying construction sites with equipment. The Moskapstroykomplekt association was created as part of the GlavUKS. It takes care not only of the 2,000 construction sites of our main administration, but also of Olympiad sites. The association supplies the Glavmosstroy, Glavmospromstroy and Glavmosinzhstroy with nonstandard equipment, nonferrous metals, furniture, tools, machinery for finishing work, and so on.

Two-year planning has necessitated long-range delivery planning. Experience has shown that the making up of complete sets must precede the start-up of facilities by at least one quarter. All this requires the creation of a strong warehouse economy. Modern, mechanized bases are now being built for the Moskapstroykomplekt.

It would be hard to imagine today a single client working in isolation from partners participating in building up the city. In many oblast centers we know there exist coordination councils attached to the city ispolkoms to direct the activity of urban developers. An operational group of main administration chiefs has been created for this purpose in the capital.

A single Moscow-wide daily schedule mandatory for all subdivisions participating in the construction conveyor has been developed. This document regulates daily delivery and shipment levels and the schedules for performing construction work. Supervision of carrying out the schedules has been entrusted to a controller group consisting of representatives of all the organizations concerned and headed by the client. Glavmosstroy automated control system means of communication have been placed at its disposal.

All these organizational steps are aimed at achieving end results -- the start-up of projects -- as quickly as possible. The GlavUKS now is examining the possibility of changing over to calculations for projects put into operation, which will facilitate accelerating their installation schedules. In a word, the single-client service management mechanism is constantly being improved.

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URBAN DEVELOPMENT PLANS FOR LENINGRAD AREA DESCRIBED

Leningrad STROITEL'STVO I ARKHITEKTURA LENINGRADA in Russian No 12, 1979
pp 10-13

[Article by Ye. I. Izvarin, candidate of architecture, and S. V. Markov, economic geographer: "The Strategy of City Management; Problems of the Relationship of Socioeconomic Planning and Urban Planning"]

[Text] An inclination to overestimate the importance of any one aspect of urban development has been a constant problem in the desire of designers and theoreticians to extol the real development of such complicated socioeconomic, cultural-historical and spatial systems as a large city and the related agglomeration. Clearly the overcoming of one-sidedness is a guarantee for the comprehensive and real transformation of urban development policies.

Cities, often independently of their specific geographic position, have a number of universal structural features which are described by general schemes such as radial and radial-ring, Hippodamus grid, lines, stars, grids and so forth. Spatial evolutions occur, as a rule, again according to a universal scheme. Having started from a "dot," the most viable settlement sooner or later grows to an agglomeration and on the functional level encounters approximately the same range of problems, although their social nature in the capitalist countries is fundamentally different than in ours.

Leningrad is also experiencing definite difficulties in a specific and concrete form. The high rate of completing housing still has not caught up with the greater demand for it. A disproportion exists between the demographic structure of the population and the composition of the apartments in the old and new housing. The scope of erecting service facilities is insufficient. A significant number of microrayons is put into operation without being fully complete and without proper public amenities. The facilities of the utility infrastructure are not completed on time. The construction of the subway, the streetcar network, the transport bypasses and pedestrian tunnels has lagged behind the necessary indicators. The city is not provided with meridional links for handling truck transport, or garage facilities for individual vehicles.

Long-range goals of enormous importance have been designated for solving many particular problems, comprehensive research is underway, and significant efforts are being made. Great attention is being given to the questions of developing the transport network in the city and agglomeration, improving the natural environment, upgrading the recreational and landscaping system, and eliminating the threat of flooding.

At the same time the demand for a modern comprehensive approach consists in bringing certain problems to the forefront, without overlooking other ones, and taking coordinated actions in all main areas with the predicting of the possible consequences.

Previous experience has shown that the actual processes occurring in such complicated socioeconomic cities as the Leningrad agglomeration often contradict the intuitive notions of individuals who sometimes take decisions without a sufficiently objective basis. This gives rise to the pessimistic notion that the problems of a city, regardless of any possible measures, remain unsolvable.

The reason for such a seemingly hopeless situation is to be found in the discrepancy between the aims of long-range planning and the particular, specific decisions caused by the temporary situation of the given stage. Often measures which seem easily feasible and promise a rapid effect merely complicate the nexus of contradictions left to the future.

For this reason in order to actually predetermine the course of events in the desired direction, it is essential to rely on truly objective knowledge on how the diversity of economic and social processes influences and will influence the city expanse.

Controlling the development of the environment of human activity without its adequate theoretical support will become clearly ineffective. On the agenda is the problem of turning the notion of the urban developers about their concern into an ordered teachings dealing with the entire city. The difficulty of such a positing of the question is that the concept of the "city" loses its customary definiteness, if one takes into account not only the constantly changing administrative limits, but also the entire aggregate of national economic relations which encompass a significantly greater territory which gravitates to the basic core. Let us endeavor to sketch in the outlines of this entity, moving from more general notions.

The Problem of Comprehensiveness

> The time has arisen for the exemplary posing of the... "whole," that is, not an economy, not an economic sector, not an enterprise, but rather the total of all economic relations, the total of all economic activity of at least a small locality...
>
> V. I. Lenin

For the more effective use of a territory with its natural and labor resources, the running and development of the economy must be carried out on a comprehensive basis. This idea has been embodied in all the national economic programs. The first attempt at implementing it was the GOELRO [State Commission for the Electrification of Russia] Plan approved at the beginning of the 1920's, and this was further developed in all the five-year plans.

In the 1940's there appeared an integrated and ordered notion of the territorial industrial complex [TPK] as an interrelated combination of production enterprises and population points on a limited territory or on the territory of an economic region (N. N. Kolosovskiy). It was based upon the concept of energy and production cycles, the essence of which is that on the basis of a certain type of raw material and energy, there naturally arises a chain of technologically interrelated enterprises which sequentially process the given raw material up to the obtaining of a finished product. Such a chain has been termed the energy and production cycle.

With the subsequent concretization and enrichment of the notion of a TPK, predominant attention was paid to the production sphere and the extraction of raw materials. This has been reflected up to now in the interpretation of production complexes on the vast resource-rich territories in the eastern regions of our country.

The economy of developed socialism has increased the importance of the nonproduction sphere, and this is affirmed by the comprehensive economic and social development plans which, in addition to industrial growth, also make provision for such components in the vital activities of the population as cultural and consumer services, public health, science and education. Such an evolution has been reflected in the theoretical tendency which would incorporate in the TPK not only production but also the social infrastructure and the population as the supplier of the labor resources and the consumer of material goods.

In such an understanding the TPK is now turned into a territorial socioeconomic complex, or more accurately is a most important component of the latter, and represents the physical, material part of production localized on a certain territory. It can include both industrial and territorial enterprises related by a common utility or production infrastructure. The recently accepted interpretation of the TPK as a territorial-production (and not just an industrial) complex corresponds more to this enriched content.

The TPK is formed under definite historical and natural conditions, undergoing a number of sequential stages in its development: from the primitive, when separate enterprises exist, to the complete, when the degree of comprehensiveness becomes maximal.

The specific features of the TPK are represented by the production of the predominant type of product, and this reflects the division of labor on a national scale. A particular feature of the TPK based on urbanized giants such as Moscow and Leningrad is a functional multidimensionalness, although their specialization here is not diluted but is determined by the predominant production of products from the leading sector. For Leningrad, for example, this is machine building comprising 44 percent of the total volume.

The structure of the TPK is set by the specific conditions and particular features of combining the sectorial and territorial elements. The dimensions of the occupied territory influence the hierarchy of the TPK which has as a minimum three levels (on the national scale):

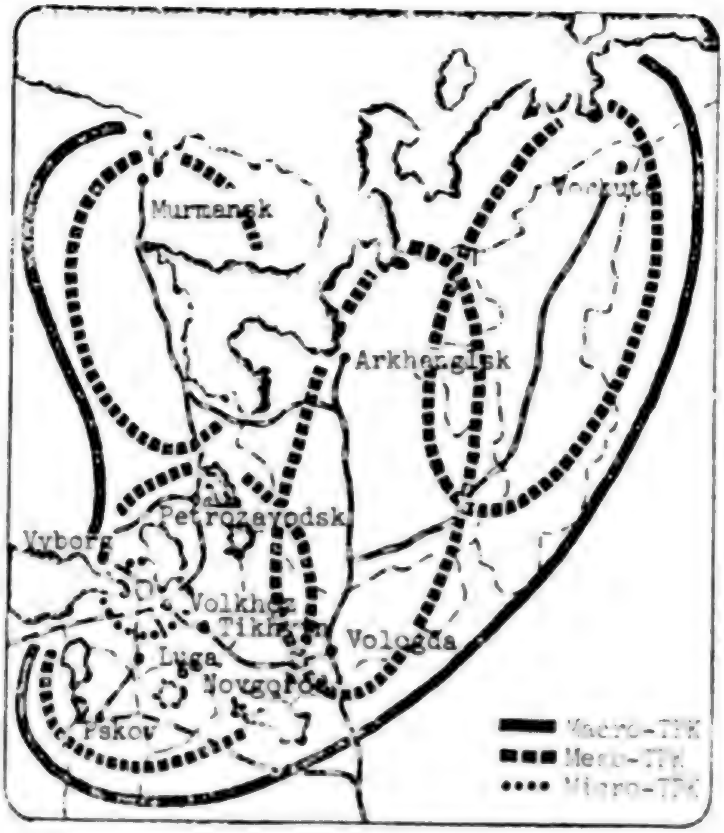
1. The macro-TPK. The grid of the general economic zoning of the USSR provides for 18 major economic regions. Several of them due to their impressive size and internal heterogeniety include several macro-TPK, and thus their overall number reaches 30. These macrocomplexes are functional elements of the nation's territorial structure and are most significant in the national economic preplanning studies. On the territory of the Northwestern Economic Region which can be viewed as a single integrated complex, one can distinguish the Northwestern and Dvinsk-Pechora macro-TPK.

2. The meso-TPK are parts of large economic regions and have a specialization on a national scale. On the territory of the USSR there are up to [illegible] subnational meso-TPK. Their scale is usually set by the territory of one or several oblasts. In the Northwestern Region of the RSFSR, four mesocomplexes can be established having their own specialization, their own key national economic problems, and specific combination of economic and natural conditions. These are the Murmansk, Komi ASSR, Arkhangel'sk (the oblast of the same name and a portion of Vologodskaya Oblast) and Leningrad (Leningrad, Pskovskaya and Novgorodskaya oblasts, Karelia and the western part of Vologodskaya Oblast).

3. The micro-TPK is an aggregate of production enterprises on strictly contact territories united by close production (technological and reproduction) ties and using a common utility infrastructure. In terms of the scale of territory, such a complex corresponds to a large urban agglomeration or to a group settlement system with a developed sectorial specialization. The "Manual on Zoning Territory for the Purposes of Regional Planning" establishes 446 economic microrayons on the territory of the entire nation, and in them the micro-TPK are formed.

For each level of TPK there is a characteristic set and intensity of ties between the elements. While on the macrolevel these are the production and economic ties, on the mesolevel the cultural and domestic ties are added to them. Finally, on the microlevel there also appear the intensive back-and-forth migrations of the population for labor purposes, and a social community of the population of the city and the contiguous territories arises.

The aggregate of such interrelated settlements more and more often is perceived as a certain whole. It is worthy of note that Leningrad which was



Levels of a Territorial-Production Complex

the pioneer in working out comprehensive plans has strengthened the coordinated examination of questions relating to the development of the city and the oblast.

Within the limits of the economic microregions, due to the fact that their areas are small, planned interactions of the individual parts of the territory appear. This interaction occurs when systems of population points are formed around a sufficiently expressed urbanization center. There begins a process of the territorial and functional integration of the population points, and zones of mass recreation, and a road network serving the daily and weekly trips of the inhabitants develop.

The present state of urban development requires that its theory reflect the object of precisely this complexity, on a higher level. With such an approach the territorial aspect remains important as it determines the limits of the city itself and the zone gravitating to it.

The Zone of Influence

> The revolution in science and technology requires fundamental changes in the style and methods of economic activity, a decisive struggle against inertia and routine, a true respect for science, the ability and desire to consult with and consider it. It requires an improvement in planning....
>
> L. I. Brezhnev

The limits to the territorial development of Leningrad are obvious from the studies of the current general plan. On the west the spatial expansion of the city is stopped by the Gulf of Finland, on the south by the airport and the Pulkovo Astronomical Observatory, on the east by the lands which are unfavorable for mass construction due to geological structure (peat bogs), and on the north and northeast by the improved agricultural lands.

The existing territorial reserves in the southwestern and northwestern areas already have detailed plans drawn up, and the resources of Vasil'yevskiy Island, after the eroding of the littoral territory, are virtually depleted. Thus, the further spatial development of Leningrad to an ever greater degree will be determined by intensifying the ties with the external surrounding. How can this rather hazy concept by concretized?

The limits of the urban surroundings (influence or gravitation) can be defined differently, for example, administratively, functionally, geographically, and so forth. The historical development of a socioeconomic entity which is the context of the existence of Leningrad has also been reflected in the unique pulsation of the zone of its influence.

During the first years of Soviet power, Leningrad, as a highly developed industrial center, extended its influence over the entire territory of the present Northwestern Economic Region. Then on its periphery there arose rather large industrial centers such as Murmansk, Arkhangel'sk, and others. Their development was accompanied by the formation of local settlement systems around them. The development of Leningrad, in remaining the regional center, in this instance assumed an indirect nature.

At present the concentration of various forms of activity, primarily industrial production, in our city has reached such a degree that a further rise in it is already undesirable due to the acute lack of resources, the necessity of protecting the environment and the rationalization of ties with other regions of the country. Under these conditions, Leningrad's zone of influence is again broadening, and this is apparent in the shifting of industrial enterprises not only outside the city limits but also outside the oblast.

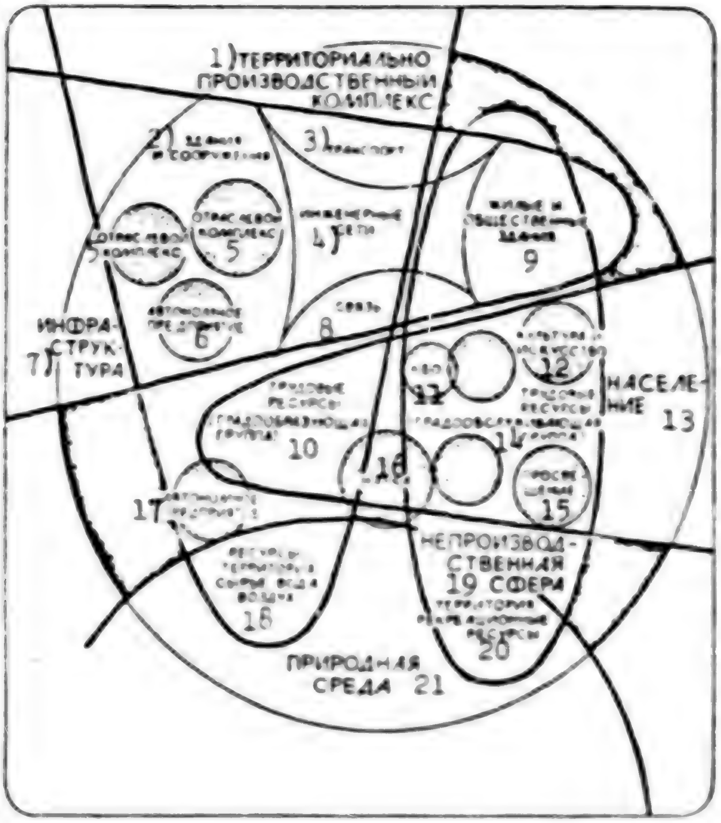
The locating of affiliates of Leningrad enterprises on the territories of neighboring oblasts in the 1960's brought about the development of their industry. In 1967, the Pskov affiliates of a number of the Leningrad production associations were responsible for 27 percent of the gross product of Pskovskaya Oblast and 23 percent of the industrial-production personnel. This made it possible to more fully utilize the local material, technical and labor resources which in the middle of the 1960's showed a surplus, and to accelerate the development of Pskov, Velikiye Luki and other cities. The basic mass of enterprises in Novgorod light industry is affiliates of the Leningrad production associations, and the total share of Leningrad Oblast in the economic ties of Novgorodskaya Oblast is 85 percent. Similar facts exist in Karelia, Vologodskaya and other neighboring oblasts.

In addition, we should note the reciprocal influence of the nearby oblasts and the Karelian ASSR on Leningrad. First of all, this is the supply of agricultural products and the delivering of natural and production raw materials. For example, Vologodskaya Oblast which produces about 80 percent of the ferrous metal in the entire Northwest delivers it to Leningrad. The Leningrad TETs No 15 is a major consumer of Pskov peat, and the GRES No 8 consumes Novgorod peat.

The problem of interference (the reciprocal penetration) of the limits of the neighboring urbanized zones, be they limits of influence, administrative, functional and so forth, is characteristic for territories which from the economic viewpoint are evenly developed. Leningrad and its surroundings, in contrast to the complexes of the Ukraine, the Central Economic Region, in this sense is not typical, although here, on the level of [illegible]-TPK, the boundaries of its production influence "invade" the territory of Pskovskaya, Novgorodskaya and Vologodskaya oblasts and Karelia.

An examination of a territorial object (city, agglomeration, and so forth) in one or another aspect makes it possible to draw various boundaries. The essential functions which determine these aspects are usually considered the following: Industrial and production activities fixed by production ties; labor activities of the population represented by its labor correspondences; utility and domestic services materialized in the networks and corresponding institutions; agricultural support determined by the territories used for supplying the city with raw materials and food; recreational activities encompassing the zones of regular mass recreation; administrative activities reinforces by the existing territorial division; cultural and educational activities embodied in the corresponding networks and institutions. Other more particular "viewpoints" of an object are also possible, and with available information these can provide curious characteristics of the studied territories.

However the limits of any functional zone are of interest only to the person who is "inside" this functional "cross-section." This could be the representative of the trade sphere, the educational system or transportation. As for the urban developer, for him the important limit is a comprehensive one which might conditionally be styled the average of all the [illegible]. Why does he require this?



Schematic Diagram of a
Socioeconomic Territorial Complex

Key:
1--Territorial production complex;
2--Buildings and installations;
3--Transportation;
4--Utility networks;
5--Sectorial complex;
6--Autonomous enterprise;
7--Infrastructure;
8--Communications
9--Housing and public buildings;
10--Labor resources (city-forming group);
11--Utility, consumer services;
12--Culture and art;
13--Population;
14--Labor resources (city-serving group);
15--Education;
16--Science;
17--Autonomous enterprise;
18--Resources: territory, raw materials, water, air;
19--Nonproduction sphere;
20--Territory, recreational resources;
21--Natural environment.

In the first place, in order that the regional planning not encompass excessive territories which do not correspond to the actually developing socioeconomic complex. This not only leads to increased costs of the design specifications (due to the exaggerating of the amount of surveys and the collecting of initial data), but is also reflected in the economic soundness of the plans, as a consequence of which incorrect decisions may be taken.

Secondly, in order to avoid reducing the territories needed for developing the agglomeration core, or for replenishing its labor, raw material and energy resources. With the "insular" position of the Leningrad agglomeration which occupies the territory of the oblast (within a radius of 50-60 kilometers), this problem is particularly acute.

The Ukrainian scientists D. I. Bogorad, N. F. Timchuk and others have achieved definite advances in searching for the comprehensive limits of certain agglomerations. Analogous work has also been started at

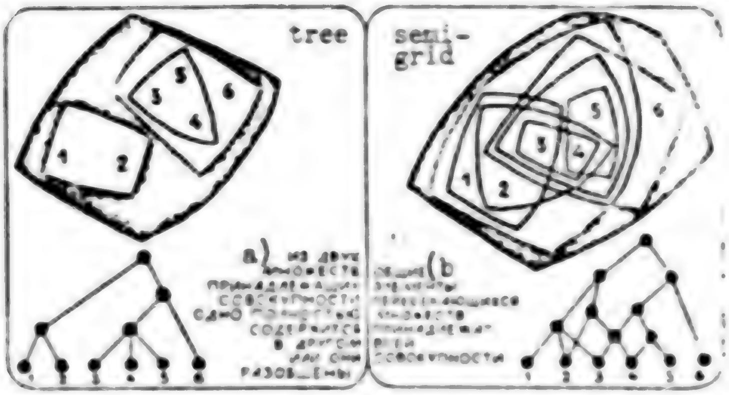


Diagram for constructing a city
according to the "tree" and "semi-grid" principle

Key: a--From two sets belonging to an aggregate, one
fully contained in another or they are separate;
b--Common elements of intersecting sets belong to
the entire aggregate.

LenNIIproyekt [Leningrad Scientific Research and Design Institute] and with the available necessary statistical data and on the basis of extensive surveys, this will lead to disclosing the sought limits which, of course, require constant correcting.

As of now we have merely sketched in certain research approaches to the existing urbanized objects. And on the basis of them as yet little could be said about the objects of the future, that is, those being forecasted, planned and designed. Means of the highest magnitude of generalization and synthesis are required, and these must provide a reliable basis for the expertise and intuition of the urban planners and builders.

At the same time, any applied research methodology, like design experience, threatens to remain unproductive without any tie to a fundamental study of the urban formations in their natural spontaneous development with the impact of design activities on their fate.

The Guarantee of Optimality

> The scale and complexity of our multisector economy, and the necessity of a sharp rise in the efficiency of social production and the material and cultural level of the population necessitate the comprehensive and planned development of the economy and urban system as a whole, the defining of the development prospects of the sectors, and the close coordination of the prospects of each sector with the prospects of the urban economy.
>
> [illegible]

It means little to say that an urban development object is a very complicated system. It must be considered that its functioning gives rise to problems that are not only purely economic (distinct, and seemingly not concerning architects), but also a truly general problem and without controlled involvement in this it is impossible to design a city in the old manner, by the "rule of thumb."

Of course, effective management over the spatial development of such a complex system as the Leningrad agglomeration, with full consideration of the socioeconomic processes occurring in it, is possible only on the basis of disclosing the objective patterns which often come into conflict with the normative regulations.

It turns out that in contrast to an artificial city which is designed according to certain ideas and in which there is nothing extraneous, a naturally developing organism exists with a redundancy of ties and functions. As was proclaimed 15 years ago by the American architect and mathematician C. Alexander, "a city is not a tree," and even if such a structure is imposed on it, it begins to live according to the scheme of a semi-grid.

The arising contradiction between the initially set "limit" and the real needs of a city is eliminated "without preliminary permission," and as a rule also in a rather spontaneous manner.

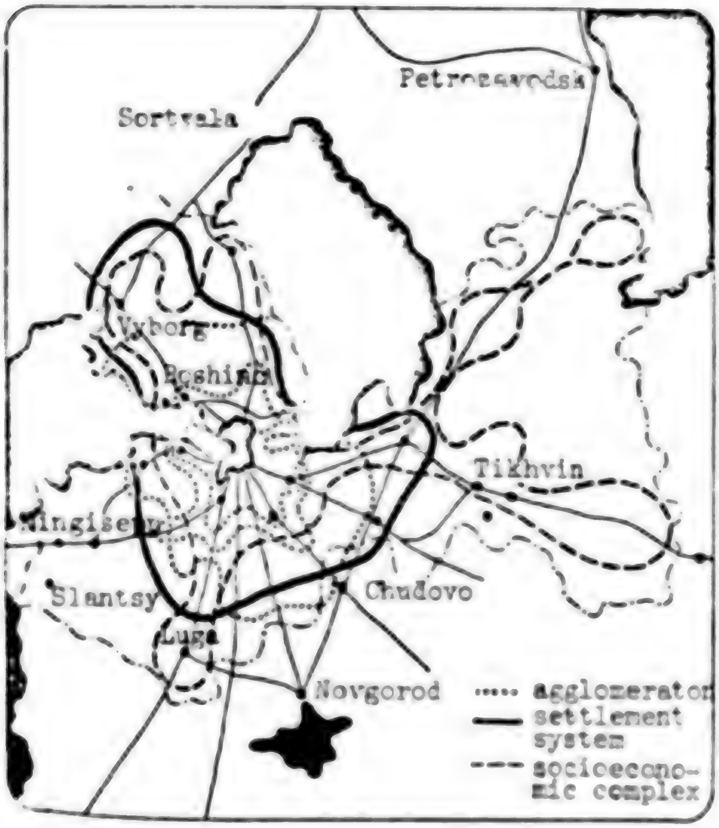
As a consequence of this the constant necessity arises of correcting the plans and designs after the fact and with great outlays not only of money but also labor and natural resources. In the event that the mistaken moves are irreversible, the consequences of the decisions can be lamentable.

The activities of Shop No 1 of LenNIIproyekt are an example of the correction strategy of Leningrad urban development aimed at correlating the long-range plans with the current tasks. According to the accepted methodological position, this is carried out in three areas or cross-sections:

1) The elaboration of the individual city infrastructure systems: a comprehensive transport system, the utility equipment systems, the individual components of the social infrastructure, the schemes for the development of public health, trade, consumer services and so forth, the plans for the conservation and improvement of the natural environment, the general plan for improving the air basin, the sanitary cleaning of the city, the protecting of the city against flooding, and so forth (the sectorial cross-section);

2) The elaboration of detailed planning for the individual city rayons: the areas of new housing construction, nonresidential and recreational zones, the reconstruction of the existing parts of the city. (Territorial cross-section);

3) The elaboration of 15-, 5- and 2-year plans for the location of all types of construction and related utility equipment (the time cross-section).



The multiplicity of treatments of territorial systems and complexes in the Leningrad zone of influence

All these documents are worked out in close coordination with the system of comprehensive economic and social planning. This is particularly true of the time cross-section.

Such a strategy under present-day conditions rather successfully helps to overcome the contradictions between the design plans and the needs of life. However, in the future a better procedure is required for the accurate and early determination of the development paths of a city (agglomeration) with the coordinating of the economic, social and urban development tasks in terms of all stages and "cross-sections," and with an understanding that redundancy is not superfluous but rather a necessary condition in the functioning of the system.

A substantial practical contribution to improving the coordinating and integrating activities on the city level has been made by the Planning Commission of the Executive Committee of the Leningrad City Soviet which recently carried out a structural reorganization in light of the new tasks. At the same time, the complexity of an interrelated solution to the entire range of problems requires the elaboration of a dependable instrumentarium which would help to significantly increase the efficiency of such work.

What scientific means could lie at the basis for effective management of [illegible] object? At present they are only being "crystallized" in the awareness of the researchers, but it is important to formulate the underlying principles for such searches.

The customary style of emperical analysis of urban development reality involves the collecting of a mass of sometimes interesting and even important but scattered data without the "correlating" of them into general models. In such a manner they can scarcely explain, help to estimate, work out and make decisions. Essentially, in our urban development practices, up to now not only analytical models of large urban formations but even descriptive ones have been extremely rare. And certainly a descriptive model is first of all a tool for an exploratory generalization of information, for example, on such important facts as population geography, labor employment, the nature of the utilization of urban territories, and so forth. Often we lack not only refined theoretical approaches but even modern techniques for the storage and processing of the information.

[illegible] professional games which are embodied in dynamic models and which [illegible] managerial and administrative spheres have begun to make headway in urban development. With the availability of the appropriate equipment and the necessary information, it is even possible to create such programs for computers and by which it is possible to simulate the processes occurring in a large city and the change in them with one or another action.

In this regard of great interest is the possibility of playing through the course of solving conflict situations in the vital activities of a city, for example, in the relationships between the local soviets and the enterprises under the Union and republic ministries and departments when they [illegible] developed in the not most rational manner. For example, [illegible] more than one-half of the industrial product is produced by the Union enterprises, around one-third comes from republic enterprises, and only an insignificant portion from the city enterprises.

[illegible] it is [illegible] concluded that the incorporation of such a tool into the system of urban activities would have a significant influence, for example, on [illegible] the optimal development of the city and agglomeration. In this manner it would be possible to obtain a guarantee for the most reasonable course of urban development, in reducing the danger of its irreversibility and lowering the number of possible errors.

[illegible] conducting the further search in the designated areas will make it possible to deepen and improve the scientific basis for the regional [illegible] and the new general plan, in contributing to [illegible] coordination with the economic and social development plans of the [illegible].

[illegible] 1973

GREATER EFFICIENCY IN REGIONAL CONSTRUCTION PROJECTS PROPOSED

Leningrad STROITEL'STVO I ARKHITEKTURA LENINGRADA in Russian No 12, 1979 pp [illegible]

[Article by Candidate of Economic Sciences V. I. [illegible] and engineering economists A. Ya. Zor and V. P. [illegible] of the Northwestern Affiliate of the Central Economic Scientific Research Institute Under the RSFSR Gosplan: "The Concentration of Forces and Resources"]

[Text] The greater scale of the national economy and the complexity of interbranch and interterritorial ties at the present stage have raised the problem of the maximum concentration of forces and resources for carrying out the most important statewide and regional economic and social development programs. In the Accountability Report to the 25th Party Congress, Comrade L. I. Brezhnev emphasized that in the era of mature socialism "organization, planning, the further improvement of economic management in the broadest sense of the word, is to become the decisive element."

Capital construction largely determines the development of all the national economic sectors. This was reemphasized in the recent decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Raising Production Efficiency and Work Quality."

The decree examines a range of problems relating to the planning and management of capital construction, and outlines a system of measures which should ensure dynamic growth of production efficiency and labor productivity. In this regard, among the many other directions for solving the set problems, there are plans to implement a systematic concentration of the efforts and more efficient use of production capital, the material, labor and financial resources. The councils of ministers and the corresponding ministries of the Union republics should work out measures to improve the organization of construction so as in the 11th Five-Year Plan to convert to a two- and three-link management system.

[illegible] the directions for such a changeover [illegible] be the further development of concentration, specialization and cooperation in capital construction, where certain features are inherent to the given processes. In creating new fixed capital, in reconstructing, enlarging and reequipping the fixed capital of other national economic sectors, construction to a significant degree determines overall scientific and technical progress. At the same time it is most closely tied to the economic and social development plans of the region and the investment policy of the state. The intensified development of territories which has been carried out in recent years, and the setting up of large industrial centers make the questions of the further enlarging of the construction subdivisions particularly timely. And the determining of their optimum sizes is substantially influenced by the territorial construction density, by the structure of the fixed productive capital, by the state and load factor of communications, and so forth.

The most effective way for concentrating construction, in our opinion, is [illegible] upon association along the lines of the similarity of the production cycle of the organizations and subdivisions which are capable of quickly solving the designated problems within the set time. Such a path requires the consolidation of permanent cooperating ties between all participants, as well as greater clarity and steadiness in all production.

We proceed from the view that the nature of the concentration process can be most fully depicted by the indicator for the growth of the annual volume carried out by the construction subdivisions themselves. Other indicators such as the volume of work for the general contract, the value of fixed capital or the number of workers, are far from fully characterizing the size of the enterprise.

In examining the state and development of the concentration process in the construction industry of the Leningrad national economic complex, one must note definite advances made in the process of reducing the number of enterprises with less than 7 million rubles of work done by them a year. Ten large production associations have been set up and are operating at [illegible] (Main Administration for Housing, Civil Engineering and Industrial Construction of the Leningrad City Executive Committee). In recent years, the number of projects simultaneously under construction has been reduced by one-fourth, and the territorial construction density has thus increased.

Along with this, it is essential to point out that production concentration is still being carried out at an insufficient pace, and recently one can even note a tendency for a certain decline in it. Characteristically, in [illegible] the number of general construction organizations rose by approximately [illegible] percent for us, while the specialized ones increased by just [illegible] percent. This reduces the opportunity to utilize those advantages which come from the process of deepening specialization with an optimum cooperation system.

On an average for the region, each construction organization currently puts out 3.7 million rubles of work a year using its own forces. However, there still is a significant number of subdivisions whose indicators are much lower. For example, the 27 organizations of the USSR Minvodkhoz [Ministry of Land Reclamation and Water Resources] carried out a program averaging 2.4 million rubles each, and four enterprises of the RSFSR Minvodkhoz had program level of 0.7 million rubles each.

According to the data of Promstroyproyekt [State Institute for Sanitary-Engineering and General Construction Planning of Industrial Enterprises], in [illegible], 86 percent of all the existing construction subdivisions had an annual work volume below the average regional level. The basic bulk of small and very small ones is under the nonconstruction ministries and departments. As a rule they carry out only small jobs in the area of the reconstruction of fixed capital exclusively at departmental enterprises.

In this connection, we should approve and widely employ the experience of the Soyuzelektroremstroy [Unionwide Electrical Repair and Construction Trust of the [illegible] Ministry of Electrical Engineering Industry]. Being one of the largest repair and construction enterprises in the region, it carries out more than two-thirds of all the work done by its own forces for other ministries and departments under the cooperation principle. [illegible] ways for concentrating production for the small organizations of different affiliation located and operating in [illegible]

In recent years there has been a certain slowdown in the growth of concentration [illegible] in the leading contracting "glavks" [main administrations] [illegible] of the region. This can be judged from the fact that [illegible] in particular, the increase in the amount of work [illegible] the existing subdivisions [illegible] According to the data of the USSR [illegible] and the average annual work volume for each of them [illegible] percent.

[illegible] there has been a certain decline in the [illegible] main administrations. [illegible] the proportional amount of work [illegible] with a corresponding [illegible] specialized ones. [illegible] carried out [illegible] percent [illegible] was but 77.? percent, and [illegible] 73.? percent.

Also characteristic for Glavzapstroy [Territorial Main Administration for Construction in the Western Regions of the RSFSR] of the USSR Ministry of Construction is a relatively low level of production concentration which to a certain degree is justifiable by the insufficient territorial density of the construction being carried out. Regardless of the achieved rather high intraglavk specialization, the data of the recent work period indicate a slowdown in this process. Over the 3 years of the Tenth Five-Year Plan, the work volume carried out by own forces and calculated per trust has remained on the level of the end of the previous five-year plan, while the volume of general contracting work has even declined by more than 6 percent. The primary subdivisions of the trusts have increased their capacity by only 2-3 percent with the previous growth of 25-27 percent in the Ninth Five-Year Plan.

The process of concentration is occurring most intensely at the enterprises of the specialized construction departments, where great attention is paid to these questions. Over the 7 years, the average work volumes per organization of the Ministry of Installation and Special Construction, the Ministry of Transport Construction, the Ministry of Power and Electrification and certain others have risen by almost 1.5-fold.

As was shown by analysis carried out by specialists from our institute, the effectiveness of the concentration process at a certain moment can begin to be influenced by a number of negative factors the importance of which rises sharply with an increase in the production volumes. An increase in the latter, as a rule, is accompanied by a rise in the number of interrelated subsystems and elements in the construction complex, by a broadening of the territories served by the organization, by an increase in the distance to the projects, by the complicating of managerial decisions, and by a rise in the time for implementing them. This substantially reduces the clarity and efficiency of management.

Due to this, reserves with neutralizing possible deviations from the track [illegible] the managed system from a certain moment cease to fully ensure its [illegible] requirements in quantitative and qualitative terms. The moment arrives when the quality of the managing body ceases to conform to the administrative structure managed by it. It can be said that beyond the limits of the "reasonable [illegible]" the system reduces the efficiency of its activities. For this reason, in forecasting the process of a further improvement in the construction organizations, the determination of [illegible] and consequently the "reasonable [illegible]" are of great significance.

Our institute is conducting research on determining the rational capacity of primary construction subdivisions under the conditions of the Central Nonchernozem Economic Region. The methods of mathematical statistics used made it possible to [illegible] a significant number of actual reporting data. These have been grouped by territorial zones, types of specialization, and other characteristics. We have also employed analytical and graphical methods for elucidating the trends and dependences. The calculations were carried out on a M-220 computer using the AP-1 program.

On the basis of the groupings of initial data, the influence of the concentration level on the individual technical and economic indicators in the operation of the construction organizations was determined. Models were obtained for determining the rational sizes of the production subdivisions. As the research has affirmed, when the subdivisions reach a certain optimal size, the indicators of their operations gradually decline, and then even deteriorate sharply. First of all there is a rise in the proportional cost of the construction and installation work, and this is explained by the rise in the number of projects under construction and by the increase in the average distance to them.

The calculations drawn up on the rational size of the enterprises and the levels of production concentration correspond fully to the local conditions with their given degree of territorial scattering of capital, the management organization, the status of fixed capital and the specialization level. The dependence of the efficient operations of the organizations upon the level of production concentration and the rational sizes of the subdivisions for the Integrated National Economic Complex are shown [illegible] the given graphs.

An analysis of the parabolic curves indicates that significantly before the reaching of the lower limit for the rational size of the subdivisions there is a slowdown in both the growth rate of labor productivity and the rate of decline of work costs. This is related primarily to the "management inertia." Hence, an improvement in the organizational structure of the construction subdivisions and their management apparatus must begin before the achieving of the critical parameters.

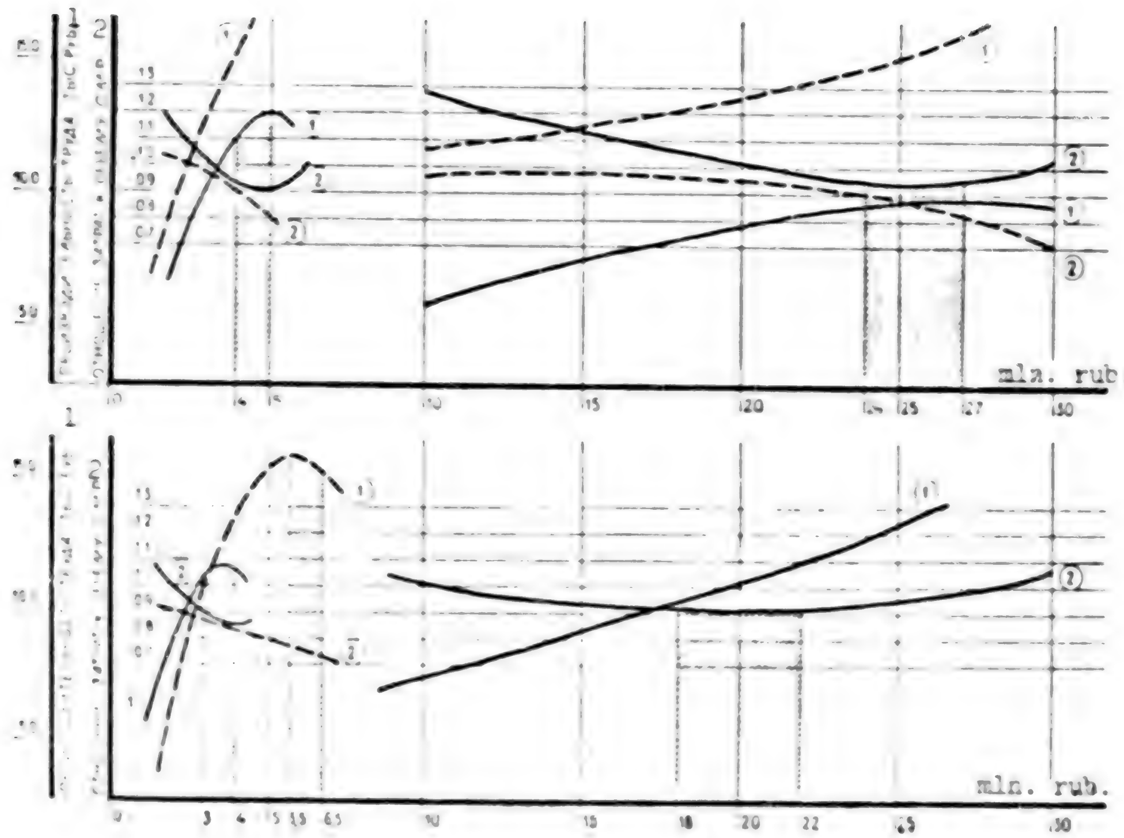
The research results make it possible to draw the following basic conclusions:

1. The [illegible] efficiency of the construction and installation organizations can be increased [illegible] for the [illegible] time.

2. The negative influence of a series of factors on the construction [illegible] can be reduced by [illegible] the number of projects under simultaneous construction.

3. [illegible] the efficiency of the [illegible] production [illegible].

4. [illegible] of production concentration [illegible] must be accompanied by [illegible] of measures to improve the [illegible] management [illegible] before reaching the [illegible]."



Dependence of Indices [illegible] on the Size of
Construction-Installation Organizations
[illegible] (above) and [illegible] (below)

——— General construction organizations

- - - - Specialized organizations

▭ Rational limits to enterprise size

① labor productivity

② ratio of expenditures and volume of construction-installation work

One of the particular features in the development of capital construction in [illegible] is primarily the low level of the concentration processes in the general construction organizations. In [illegible], general contractors, in erecting the projects they carry out a [illegible]. At the same time, each of them operates as an independent [illegible] on the basis of internal economic accountability.

On the other, it is the coordinator of a cooperative process of erecting the projects. Under the conditions of a rise in specialization, all of this often leads to an overloading of the individual functional elements of the organization, it causes a rise in the need for taking a large number of operational management decisions, and diverts them from the questions of a long-range nature.

The relatively small capacity of the general construction organizations, in turn, has a substantial impact on the activities of the specialized organizations which most often operate as subcontractors. This influence is most substantially expressed in the failure to meet the dates for providing a work front to the subcontractor, and this disrupts the activities of the latter.

In our opinion, the question has arisen of fundamentally reorganizing the managerial set-up of the general contracting organizations with the establishing in an independent group of the functions of cooperation and control over fulfillment in the construction process in one or another project.

There is a whole series of variations for such reorganization, from the creation of special coordinating centers to the turning of this over entirely to the general client who would simultaneously assume responsibility for the design and engineering planning work-up. Which management [illegible] is most appropriate must be decided upon in each specific instance [illegible] specific features and conditions.

At present, the level in the coordination of construction in the [illegible] region is presently insufficient, while the management structure does not conform to the system being managed. For solving the given question, in our opinion, immediate measures are required to improve the entire construction system in the realm of the [illegible] complex. Here it is necessary to examine the question of the procedure of [illegible] construction, and above all the coordination of the most important areas of capital investments, and for [illegible] territorial and sectorial [illegible] of the construction organizations.

The absence of coordination in the activities of the ministries of the construction complex substantially reduces the efficiency and raises the [illegible] of the [illegible] measures for the creation of the [illegible].

[illegible] by the absence of a [illegible] of relations of the construction organizations with the other enterprises comprising the [illegible] complex, [illegible] development, and [illegible] coordination in the activities of the numerous ministries and departments carrying out construction on the territory of [illegible]. In our opinion, the necessity has arisen of working out uniform [illegible] balances for the material and technical resources considering their interchangeability and based upon the use of the achievements of scientific and technical progress.

Here, as is stipulated in the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Improving Production Efficiency and Work Quality," it is essential to work out a comprehensive specific program for the development of the construction industry in the Leningrad region.

This program should encompass the entire range of questions in the development of the construction complex from working out procedural recommendations on the compiling of the intersectorial balances of material and technical resources to the immediate reorganization of the construction enterprises in the region and the setting up of large production associations. Their organization is provided for in the decree where it states that in 1979-1981, all the construction ministries and departments should carry out a reorganization so that "the basic independent construction unit should be the production construction-installation associations, and in individual instances, trusts."

Thus, only the concentration of all the forces and resources will make it possible in a relatively short time to work out and implement a system of measures to develop the capacity of the enterprises of the construction complex for solving the problem of satisfying the region's demands for construction.

[illegible]: [illegible], [illegible]

[illegible]
[illegible]

CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

RURAL WOOD HOUSING CONSTRUCTION

Moscow STROITEL'NAYA GAZETA in Russian 13 Jan 80 p 3

[Article by L. Makhalov, chief of the USSR Gosstroy's department of construction industry, structures and new materials: "Unite Department Efforts to Develop Wood House Building As Quickly As Possible in Rural Areas"]

[Text] This year is the first year of implementation of the long-range program of development of the production base of industrial wood house building determined by the CPSU Central Committee and USSR Council of Ministers Decree "On Further Developing Factory Production of Wood Panel Homes and Complete Sets of Wood Parts for Homes Using Local Materials for Rural Housing Construction."

Many ministries and departments are participating in actualizing this program. This year we must begin expanding enterprises of the USSR Ministry of Timber and Wood Processing Industry -- Seletskiy Wood Processing Combine in Bryanskaya Oblast (contractor, USSR Ministry of Industrial Construction) and Novovyatskiy Wood Slab Combine in Kirovskaya Oblast (contractor, USSR Ministry of Construction). Capacities for producing 250,000 square meters per year and 450,000 square meters per year of wood panel houses, respectively, must be created here.

The USSR Ministry of Timber and Wood Processing Industry must develop construction of an experimental arbolite components and items combine in Dmitrovo, Moscow Oblast, to produce 50,000 cubic meters of items per year. At this same site the ministry also plans to build a permanent exhibit complex to propagandize leading experience in the production of wood panel houses.

Over the course of three years, beginning in 1980, the USSR Ministry of Timber and Wood Processing Industry, USSR State Committee for Forestry and the Councils of Ministers of the Russian Federation, the Ukraine, Lithuania and Latvia will change-over existing enterprises to releasing houses and complete sets of wood parts following new standard plans.

In Donetskaya Oblast, at the Ukrmezhkolkhozstroy's Dokuchayevskiy Wood Processing Combine, capacities are to be created for producing complete sets of wood parts for houses with walls made from local materials; production is to be 300,000 square meters per year. The USSR Ministry of Installation and Special Construction Work and USSR Ministry of Industrial Construction are obligated in 1980-1981 to ensure expansion at the Volgograd plant of electrical wiring to increase the production of apartment electric panels.

In order to provide complete sets of factory-finished wood houses during these years, the Ministry of Gas Industry is faced with developing and mastering the series-production of combined heating and hot-water supply units.

The USSR Ministry of Ferrous Metallurgy has been instructed to set up the production at the Gor'kiy Experimental-Industrial Metallurgical Plant of bandsaws for house-building and wood processing enterprises of the USSR Ministry of Timber and Wood Processing Industry and other ministries and departments.

A large program of planning projects is also to be carried out in 1980, construction to begin next year. By 1 July 1980, the USSR Ministry of Timber and Wood Processing Industry is obligated to have prepared and transmitted to contracting organizations technical documentation on construction next year of 17 enterprises to produce wood panel houses, complete sets of wood parts for houses with walls made of local materials, carpentry items and cement-chip slabs. Expansion and construction of these enterprises has been planned in Leningradskaya, Vologodskaya, Kalininskaya, Kostromskaya, Permskaya, Sverdlovskaya, Tyumenskaya, Kemerovskaya and Irkutskaya oblasts, Krasnoyarskiy Kray and the Karelian Autonomous Republic.

By then, USSR Ministry of Internal Affairs documentation must also have been worked out for construction of a house-building combine in Krasnoyarskiy Kray and RSFSR Council of Ministers documentation on expansion of the Zhukovo and Balashikhinskiy wood-processing plants in Moscow Oblast.

Next year we also plan to begin expanding seven existing enterprises of the Ministry of Machine Tool and Tool Building Industry in Vologodskaya, Kurganskaya, Khmel'nitskaya and Dnepropetrovskaya oblasts, Stavropol'skiy Kray and the Kabardino-Balkarskaya Autonomous Republic and Moldavian SSR, as well as of the Shedokskiy Gypsum Plant in Krasnodarskiy Kray for the USSR Ministry of Building Materials.

As we see, the work program for the current year is large. At the same time, it is only a start, and the extent to which it is successful will depend largely on implementation of the social and economic tasks set for rural areas by the party Central Committee and the government.

A check made recently by the USSR Gosstroy on implementation of the decree unfortunately showed that a number of ministries are poorly prepared to actualize the tasks set. Thus, the USSR Ministry of Industrial Construction and USSR Ministry of Construction did not include in their 1980 plans expansion of the Seletskiy Wood Processing Combine and the Novovyatskiy Wood Sheet Combine, although the technical documentation for these projects was developed.

The USSR Gosplan must make corrections in the plans of the ministries cited as regards their construction work program for Bryanskaya and Kirovskaya oblasts.

Lag has been permitted in developing USSR Ministry of Light Industry technical documentation for an experimental arbolite components and items combine in Dmitrovo, Moscow Oblast. Ministry leaders gave assurances at a USSR Gosstroy conference that the lag will be overcome and that they will begin building the project this year.

The start of expansion of the electrical wiring plant in Volgograd was not included in the 1980 USSR Ministry of Industrial Construction plan since the customer, the USSR Ministry of Installation and Special Construction, did not develop the technical documentation promptly.

Already, this early in the year, the state of affairs in developing technical documentation for projects whose construction must be begun in 1981 is causing alarm. Take just enterprises for producing cement-chip slabs. The planning of these projects is being delayed due to the lack of proper coordination between the USSR Ministry of Light Industry, Ministry of Construction, Road and Municipal Machine Building and Ministry of Machine Tool and Tool Building Industry on the initial data for technological equipment.

In order to accelerate the planning, expansion and construction of shops and enterprises, the USSR Gosstroy has adopted a number of resolutions. Plans permit the extensive use of light metal support structures and enclosures. The RSFSR Gosstroy has been instructed to work out proposals on simplifying the procedure for coordinating and approving technical documentation for projects being built in the republic.

The RSFSR Gosstroy is obligated to coordinate the interaction of planning institutes of the USSR Ministry of Light Industry and the USSR Ministry of Building Materials when technically and economically substantiating house-building combines and enterprises to produce building materials, with a view towards siting them so as to eliminate long, inefficient hauling of materials to wood processing combines.

The USSR Gosstrov's Glavgosekspertiza [not further identified] has outlined a program for reviewing the technical and economic substantiation of enterprises in order to ensure high plan technical and economic indicators.

A decision was also made to organize an "Industrial Wood House Building" exhibit in 1980 at the USSR All-Union Exhibit of National Economic Achievements.

In noting the above-indicated shortcomings and citing the situation of enterprises whose expansion and construction must be begun in 1980 and 1981, we hope that local ministries and organizations will take the steps necessary to carry out unconditionally the 1980 tasks of comprehensively developing the production base of industrial housing construction in rural areas.

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CONSTRUCTION, CONSTRUCTION MACHINERY, AND BUILDING MATERIALS

RURAL CONSTRUCTION COMBINE SOCIALIST OBLIGATIONS FOR 1980

Moscow STROITEL'NAYA GAZETA in Russian 16 Jan 80 p 1

[Text] Party, soviet and economic organs are working systematically to actualize the resolutions of the July (1978) CPSU Central Committee Plenum aimed at concentrating capital investments, strict observance of agricultural project construction duration norms, and lowering construction estimated cost. The pivotal position here is maximum industrialization and the development of rural construction combines.

The task today is to fully utilize the capacities of existing SSK's [rural construction combines], create new combines, improve the quality and increase the degree of factory-readiness of sets of items in every way possible, and put rural projects into operation on schedule and ahead of schedule.

The collectives of the leading rural construction combines, inspired by the resolutions of the November (1979) CPSU Central Committee Plenum and the theses and conclusions contained in CPSU Central Committee General Secretary L. I. Brezhnev's speech at the Plenum, have begun a labor watch in honor of the 110th anniversary of V. I. Lenin's birth and have expanded competition for successful fulfillment of the plan for the concluding year of the five-year plan. Having declared 1980 a year of shock work, the collectives of the leading SSK's have assumed the following socialist obligations.

Moscow area rural construction combines of the Glavmosoblstroy's Mosoblsel'stroy-24 Trust in Yegor'yevsk, Klina and Podol'sk.

Put five stock-raising farms for 2,[illegible]00 head of cattle into operation by the 110th anniversary of V. I. Lenin's birth. Build and put into operation premises for 30,000 animals during the year.

Without stopping production, finish renovating the production base of the combines, master the release of complete sets of parts for a standardized multipurpose building and change over to the construction of stockraising premises using these components. Manufacture complete sets of parts for 80 such buildings, install 60 of them and put 18 into operation.

Reduce the normative schedules for installing each standardized building by an average of 25 percent, or by 2.5 months, by increasing the degree of prefabrication and factory-readiness of components and by using leading methods of organizing construction production. Reduce labor expenditures per stock place by 20 percent, or save 12,000 man-days for the three combines.

Improve the quality of construction-installation work and of the output being produced. Continue introducing the comprehensive construction quality control system. Release 98 percent of the projects with evaluations of "good" or "excellent"; release 95 percent of the output produced at plants on first demand and have 92 percent of the items certified as being in the first quality category.

Thanks to the introduction of progressive technology, save at least one percent of the stocks being allocated: 320 tons of cement, 480 cubic meters of lumber and 126 tons of metal.

Organize socialist competition among trust brigades to achieve the shortest construction time for cow barns and other buildings made of standardized components.

Yaroslavl' SSK (Primorskiy Kray) of the RSFSR Ministry of Rural Construction.

Carry out the plan for the first four months in terms of volume of contract work by the 110th anniversary of V. I. Lenin's birth, the annual plan by [illegible] December and the five-year plan by the 63rd anniversary of Great October.

Ensure the release of complete sets of components for production, housing, cultural and personal-services facilities; build by the flow-line method and release ahead of schedule, on a turnkey basis, 38,000 square meters of housing and 110,000 square meters of rural production building space.

Bring the large-panel housing construction plant up to planned capacity a year ahead of schedule, ensure the release of fully factory-ready components and certify all output as at least first-quality.

Introduce the "enterprise - transport - construction site" integral-process contract and do 70 percent of the construction-installation work by the contract method.

Save [illegible] tons of cement, 20 tons of metal, 70 cubic meters of lumber and [illegible],000 kW-hr of electricity above the established assignments.

Kalininskiy SSK of the RSFSR Ministry of Rural Construction.

Carry out the plan for the first four months in terms of volume of contract work and industrial production by the 110th anniversary of V. I. Lenin's birth and the annual plan by 28 December.

Double the production of large-panel housing construction components and increase the amount of construction-installation work 1.5-fold as compared with last year's level.

Ensure the release of complete sets of components for series-"25" houses and set up the flow-line construction and smooth turnkey release of 29 houses with a total area of 40,000 square meters with evaluations of "good" or "excellent."

Master the production of wood panels for single-apartment series-"209" homestead-type houses at new capacities being put into operation and build 150 such houses.

Organize the industrial production of prefabricated wood house elements -- roofs, frontons, and so on.

Reduce labor expenditures at construction sites by 20 percent by increasing the degree of component factory-readiness.

Increase labor productivity to the 1979 level in construction by 7.5 percent and in industry by seven percent.

Save 70 tons of cement, 20 tons of metal, 200 cubic meters of lumber, 225 tons of conventional fuel and 3,000 kW-hr of electricity.

Gatchinskiy SSK, USSR Ministry of Construction

Carry out the plan for the first four months in terms of amount of construction-installation work by the 110th anniversary of V. I. Lenin's birth and the annual plan by 27 December.

Release for operation a month ahead of schedule three stockraising complexes on Rossiya, Shugozero and Sosnovaya Gorka sovkhozes.

Reduce labor expenditures by two percent by increasing parts and component factory-readiness.

Master the production of components for cow barns with 42-meter spans.

Saratov Support-Demonstration Experimental SSK, Roskolkhozstroy association.

Release 6,300 square meters of housing above the plan by the 110th anniversary of V. I. Lenin's birth. Carry out the annual construction-installation plan of 14 million rubles by 25 December.

Ensure the release of complete sets of components for and install "25th"-series houses with a total area of 65,000 square meters, including 52,000 square meters of homestead-type two-apartment houses. Put 57,000 square meters of houses into operation and release them with evaluations of "good" or "excellent."

Organize the production of components for and by the third anniversary of the new USSR Constitution put into operation the first 140-place children's combine.

Kama SSK (Udmurtiya), Roskolkhozstroy association.

Carry out ahead of plan, by V. I. Lenin's birthday, the plan for the first four months in terms of all indicators and put into operation 3,000 square meters of homestead-type houses.

Release to the customer 12,000 square meters of homestead-type houses as turnkey units.

Manufacture complete sets of components for 200 two-apartment homestead-type houses.

Do 80 percent of the construction-installation by the brigade contract method.

In assuming these obligations, the collectives of rural construction combines call on collectives of all the country's SSK's to expand socialist competition for successful utilization of the designed capacities of combines, to reduce the amount of unfinished construction, to reduce the time involved in putting up facilities, and to release them to the customer on a turnkey basis.

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BUILDERS RESPOND TO RURAL SANATORIA CONSTRUCTION ARTICLE

Moscow SEL'SKAYA NOV' in Russian No 11, 1979 p 23

[Text] In the No 6, 1979 issue, this magazine published an article by A. Kulikov on planning and building rural interfarm sanatoria under the heading "The Rural Sanatorium: From Plan to Facility."

The following people responded:

V. Popov, deputy chairman of the board of the All-Russian Association of Interfarm Construction Organizations (Roskolkhozstroy Association).

The Roskolkhozstroy Association has reviewed the article "The Rural Sanatorium: From Plan to Facility."

As the article correctly noted, the basic reason for the unsatisfactory planning and construction of interkolkhoz sanatoria is the lack of a suitable production base.

The Roskolkhozstroy Association began building interkolkhoz sanatoria back in 1974, creating the Roskolkhozkurortstroy Association to do so. During 1974-1979, the association was sent 52.9 million rubles in capital investments to create its own production base. During that period, fixed assets worth 37.7 million rubles were put into operation.

At present, the Gelendzhikskiy production base, able to produce 15,000 cubic meters of prefabricated reinforced concrete per year, is in operation. Construction of the first line of a health resort construction combine in Anap able to produce 80,000 cubic meters of prefabricated concrete is being completed. By 1981, the combine will be producing 120,000 to 130,000 cubic meters of prefabricated reinforced concrete per year. Construction of a production base in the village of Dagomys is underway....

The Roskolkhozstroy Association is continuing to force the development of its production base so that the Roskolkhozkurortstroy will, beginning in 1981, become the basic contractor organization for building interkolkhoz sanatoria on the Black Sea coast of the Caucasus and in the Kavkazskiye Mineral'nyye Vody region.

The Roskolkhozstroy Association agrees with the conclusions of the article's author about the unsatisfactory quality of planning interkolkhoz sanatoria and about the serious plan omissions which do not permit installing these facilities with consideration of modern requirements for treating workers and their children, for their recreation. Problems of assigning the Roskolkhozkurortstroy Association to specialized lead planning-surveying organizations are now being solved.

L. Ivanov, RSFSR Deputy Minister of Rural Construction:

The ministry has reviewed the article "The Rural Sanatorium: From Plan to Facility" and admits that it is correct.

The leaders of subordinate organizations building rural sanatoria, including the Udmurtsel'stroy and Yaroslavl'sel'stroy trusts and the Tambovsel'stroy administration, have been instructed to take additional steps to intensify the production of work, to provide construction sites with personnel, material and technical resources, mechanisms and transport, with a view towards meeting the plan for the current year.

PMK-452 chief Comrade V. F. Sitnikov has been reprimanded for the Udmurtsel'stroy trust's failure to carry out the contract work plan for building a sanatorium in Uva village, Udmurtskaya ASSR.

The ministry has taken over supervision of the construction.

V. Godin, Glavtsentrograzhdanstroy Chief, RSFSR Ministry of Housing and Civil Construction.

In 1979, organizations of the RSFSR Ministry of Housing and Civil Construction are building two facilities for the RSFSR Ministry of Agriculture: a dispensary at the Sovkhoz imeni Kalinin in Kalininskaya Oblast and the Kormadon Health Resort for kolkhozes of Severo-Osetinskaya ASSR.

Facilities are presently being built satisfactorily. The dispensary is to be released for operation in the 4th quarter of 1979.

The Kormadon Health Resort is a carry-over project. This year, a construction-installation work volume of 600,000 rubles has been approved, of which 234,000 rubles was carried out in the first half of the year. The Sevosetingrazhdanstroy trust building it is taking steps to fully utilize the capital investments allocated.

L. Bibin, USSR Deputy Minister of Construction.

In 1979 the ministry is building two sanatoria for rural laborers: the Volga interkolkhoz sanatorium in Saratovskaya Oblast and the Mitino sanatorium in Kalininskaya Oblast.

The plan for these construction projects anticipates doing 800,000 rubles worth of construction and installation work, and 134,000 rubles worth had been done through the first seven months.

The lag in carrying out the plan resulted from unsatisfactory deliveries of cement, rolled metal products and lumber by industrial enterprises and from the direction by construction organizations of material and personnel resources into priority construction of projects scheduled for completion this year.

The USSR Ministry of Construction's Glavprivolzhskstroy and Kalinin TUS [not further identified] are taking steps to eliminate the lag.

I. Ravich, USSR Deputy Minister of Communications.

After reviewing the article "The Rural Sanatorium: From Plan to Facility," the USSR Ministry of Communications reports that work on providing telephone and radio facilities to the sanatoria and housing attached to it in Pyatigorsk, Yessentuki and Zheleznovodsk was done in 1978 and is being done in 1979 by PMK-210 of the Svyaz'stroy-2 trust of the All-Russian Rossvyaz'stroy Association. The work is being done under direct contract with the Roskolkhozzdravnitsa Association of the RSFSR Ministry of Agriculture.

The plan for providing facilities of the Roskolkhozzdravnitsa Association with telephone and radio communications is not being carried out at individual facilities due to an absence of construction readiness of these projects, that is, due to the failure of the customer to provide a work front.

To eliminate the lag in performing this work, the Roskolkhozzdravnitsa Association must take immediate steps to release projects for installation and the PMK-210 and Svyaz'stroy-2 trust must, on their part, do everything necessary to ensure fulfillment of the 1979 plan in the agreed-to amounts.

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